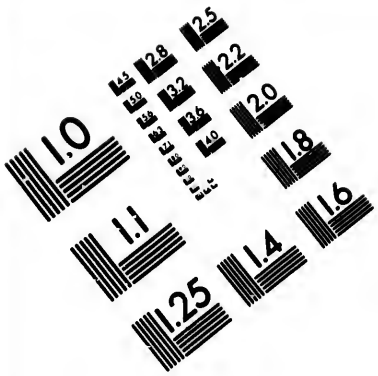

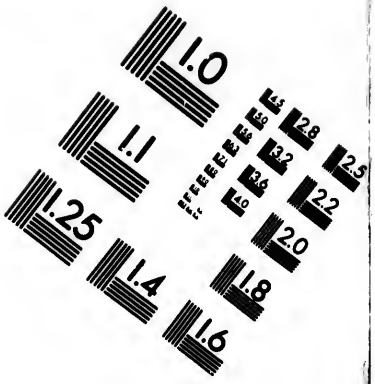

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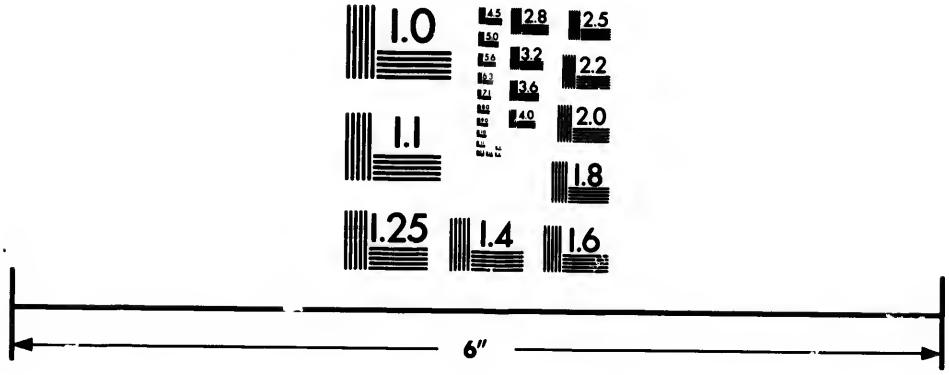

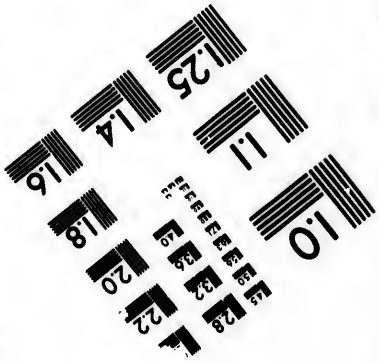

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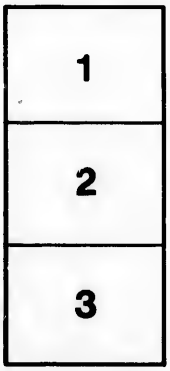

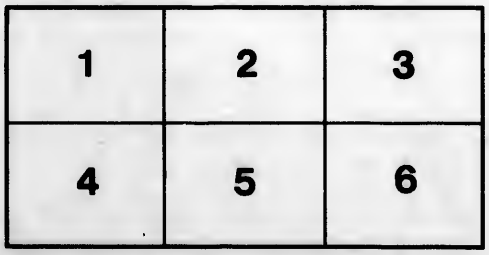

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From Arrowsmith's Map of the World.

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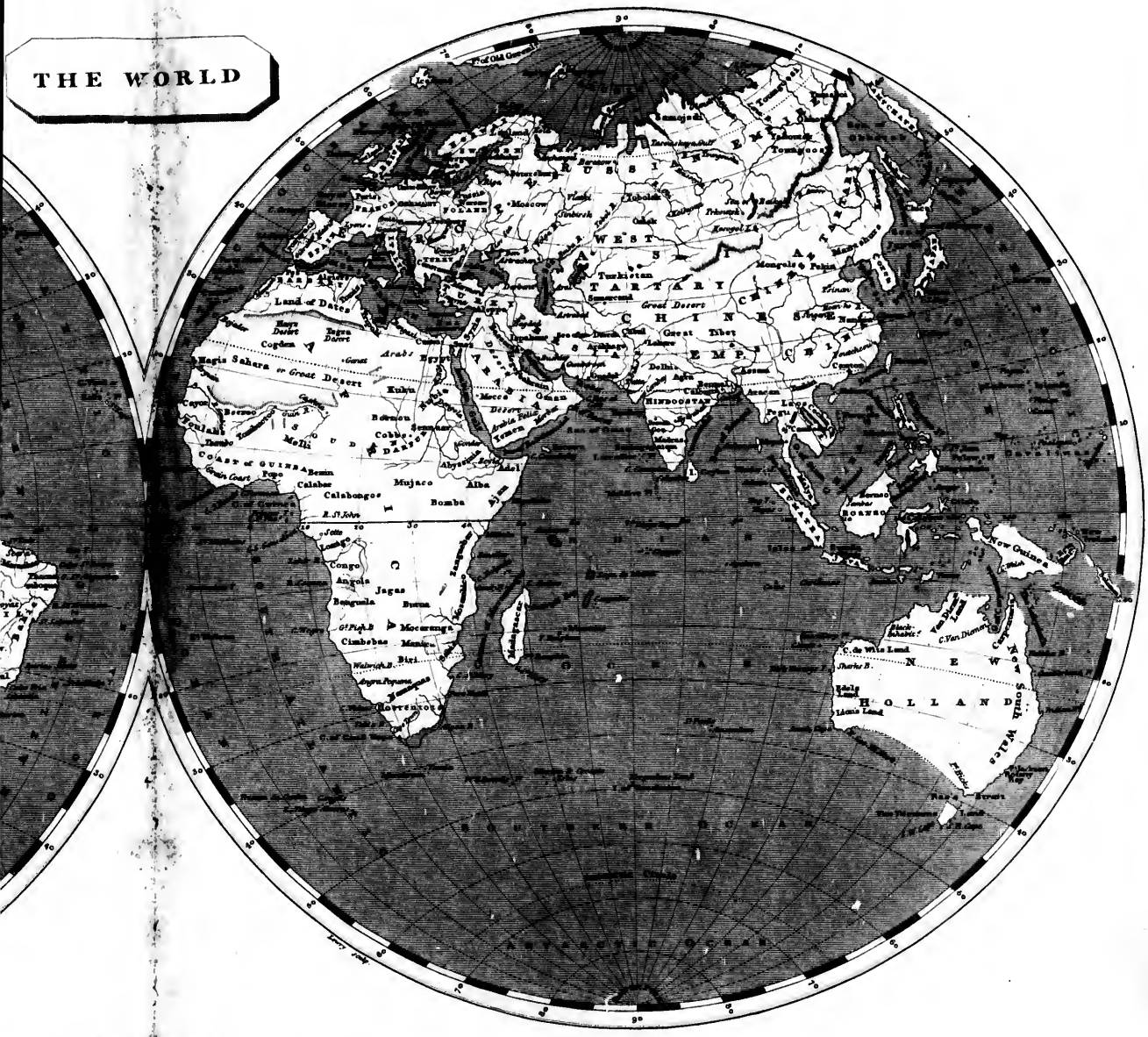
THE WORLD



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PREFACE

TO THE FIRST EDITION.

THE importance of geography as a ſcience, and the exuberant variety of knowledge and amuſement which it exhibits, are themes too trivial for argument or illuſtration. Eagerly attached to this ſtudy from his early years, the author always cheriſhed a hope that he might contribute his labours to its advancement. For much remained to be done; and many literary men have long admitted, that great advantages might be derived from a new and improved ſyſtem of modern geography, the lateſt popular works of this nature not only abounding with numerous and groſs miſtakes, but being ſo imperfect in their original plans, that the chief geographical topics have been ſacrificed to long details of hiſtory, chronology, and commercial regulations, wholly extraneous to the very nature of ſuch a deſign. When to this it is added, that the moſt recent and important diſcoveries are either omitted, imperfectly illuſtrated, or ſo defectively arranged as to embarraſs and baffle the reſearch of the moſt patient inquirer, there is no reaſon to be ſurpriſed at the general confeſſion, that ſuch compilations are only uſed becauſe there is no better extant.

The ſucceſſive diſcoveries in the Pacific Ocean, and other parts of the globe, have, within theſe few years, acquired ſuch a certainty and conſiſtency, that they may now be admitted and arranged, in a regular

and precise distribution of the parts of the habitable world; while the recent discoveries of La Perouse, Vancouver, and other navigators, nearly complete the exact delineation of the continental shores. No period of time could be more favourable to the appearance of a new system of geography, than the beginning of a new century, after the elapse of the eighteenth, which will be memorable in all ages, from the gigantic progress of every science, and in particular of geographical information; nor less from the surprising changes which have taken place in most countries of Europe, and which of themselves render a new description indispensable. Whole kingdoms have been annihilated; grand provinces transferred: and such a general alteration has taken place in states and boundaries, that a geographical work published five years ago may be pronounced to be already antiquated.

After a general war of the most eventful description, after revolutions of the most astonishing nature, Europe at length reposes in universal peace. The new divisions and boundaries no longer fluctuate with every campaign, but are established by solemn treaties, which promise to be durable, as at no former period has war appeared more sanguinary or destructive, and at the same time more fruitless even to the victors. These treaties not only influence the descriptions of European countries, but of many in Asia, Africa, and America.

A new system of geography is also specially authorized and authenticated, by the singular advantage of several important books of travels having appeared within these few years, which introduce far more light and precision into our knowledge of many regions. The embassies to China, Tibet, and Ava, for example, present fresh and authentic materials, without which recourse must have been had to more remote and doubtful information; and the Birman empire is unknown to all systems of geography. The Researches of the Asiatic Society, and

other

other late works, diffuſe a new radiance over Hindoſtan, and the adjacent countries. The labours of the African Society, the travels of Park, Browne, and Barrow, have given more preciſion to our imperfect knowledge of Africa: and the journies of Hearne and Mackenzie have contributed to diſcloſe the northern boundaries of America. In ſhort, it may be ſafely affirmed, that more important books of travels and other ſources or geographical information, have appeared within theſe few years, than at any period whatever of literary hiſtory.

In this work the eſſence of innumerable books of travels and voyages will be found to be extracted; and ſuch productions have been the favourite amuſements of the moſt diſtinguiſhed minds, in all periods and countries, as combining the variety, novelty, and adventure, of poetical and romantic narration, with the ſtudy of man, and the benefits of practical inſtruction. It is unneceſſary to repeat the names of Montaigne, Locke, Monteſquieu, &c. or that of my late friend Gibbon, whoſe collection of voyages and travels formed the moſt choſen part of his library. Why did he not write geography! Why has a Strabo been denied to modern times!

Nor muſt the rapid advances of natural hiſtory be forgotten, which now confer ſuch ſuperior preciſion of the natural geography of moſt countries. Not only have zoology and botany received the greateſt improvements; but geology and mineralogy have, within theſe twenty years, become entirely new and grand ſciences; the ſubſtances being accurately arranged, and deſcribed with ſuch clearneſs, that throughout the literary world they are exactly known and diſcriminated.*

* The preſent ſyſtem of mineralogy was firſt eſtabliſhed by Bergmann, in 1782; who was followed by Werner, 1789. Mr. Kirwan publiſhed an excellent work, 1794, two volumes, 8vo. and in general, within theſe ten years, this important ſtudy, ſo eſſential to national wealth and proſperity, has on the new principles been cultivated with ſurpriſing ardour and ſucceſs.

Yet even with ſuch advantages geography is far from being perfect; and the familiar exclamation of D'Anville in his old age may ſtill be adopted: "Ah! my friends, there are many errors in geography."* This ſcience may indeed be regarded as imperfect in its very nature, as no reaſonable hope can be entertained that all the habitable lands ſhall, at any period of time, paſs under a trigonometrical ſurvey, the only ſtandard of complete exactneſs. The chief defects are the interior parts of Africa, and many portions even of the ſhores; Tibet, and ſome other central regions of Aſia, nay even Perſia, Arabia, and Aſiatic Turkey; the weſtern parts of North America; and the Spaniſh ſettlements in that part of the new continent; with the central and ſouthern parts of South America. Of New Holland little is known, except the ſhores: and many diſcoveries remain to be made in the Pacific Ocean, particularly the extent and interior part of New Guinea, and other large lands in that quarter. Even in Europe the geography of Spain and Portugal is very imperfect, though not ſo defective as that of European Turkey; nor can we loudly boaſt while, as Major Rennell informs us, there is no exact chart of the Britiſh Channel; and the trigonometrical ſurvey, ſo far as it has extended, has detected groſs errors in the maps of the counties.† We have indeed been generally more attentive to remote regions, than to our native country; and could a new ſyſtem have been publiſhed with more advantages, than in the kingdom which has given birth to the greateſt modern diſcoveries, and improvements in geography?

* "*Ah! mes amis, il y a bien des erreurs en geographie.*"

† It is a lamentable circumſtance that geography is at times retrogreſſive in ſome points, while it advances in others. Thus Preſton's ſurvey of the Shetland Iſlands repreſents them as one third part too large, both in length and breadth, and there are groſs errors in the poſitions. The miſtake was detected in the important voyages ordered by the late king of France; and remedied in the Daniſh map, Copenhagen, 1787, but ſtill more in that of Capt. Donnelly. Theſe iſles now appear nearly as in the maps preceding 1750. Preſton's map of theſe remote Britiſh poſſeſſions has even occaſioned ſhipwrecks; and the ſcience and capacity neceſſary for ſuch a ſurvey ought to be the object of ſtrict previous inveſtigation. Many ſuch inſtances might be given.

The rapid progreſs of ſcience has alſo, within a like ſhort period, greatly improved the maps and charts of moſt countries, always to be ranked among the chief objects of geography; though unaccountably the compilers of modern ſyſtems ſeem to write without the inſpection of any map whatever, or at leaſt never make any reference of that nature. This is the more ſurpriſing, as accurate maps and charts may be ſaid to form the very foundation of geographical knowledge. The author of the preſent work has been ſedulous to diſcover the lateſt and beſt maps of all countries, in which reſearch he has been liberally aſſiſted by our beſt practical geographers. The ſmall maps which accompany the work are drawn with great care, under the directions and reviſion of Mr. Arrowſmith, who is well known by the induſtry and attention which he employs in ſelecting the moſt recent and accurate materials and improvements. The ſmallneſs of the ſize will of courſe prevent them from ſupplying the place of a large and complete atlas; but they will be found to conſtitute an uſeful introduction to ſuch a collection, as they are reduced from the beſt large maps, and the authorities added at the bottom, while they are illuſtrated with many important features of the countries, and intereſting names, derived from works of natural and civil hiſtory, for which a large and expenſive atlas may be conſulted in vain.* The latter had beſt be formed by the

* A moſt ingenious artiſt, conſiderably imbued with mathematical knowledge, having invented machines which give more clearneſs and preciſion to the engraving of ſtraight lines, the author, who had hitherto only ſeen this method employed in the repreſentation of mathematical inſtruments, and machinery, was impreſſed with its peculiar fitneſs for the delineation of water. With this idea he applied to Mr. Lowry, the inventor, and the effect is now before the public in a ſeries of maps, which may ſafely be pronounced to be not only unrivalled, but unexampled by any former efforts in this department. Not to mention ſuperior richneſs and neatneſs, it is not only ſingularly adapted to the inſtruction of youth, by the inſtantaneous repreſentation of the form and chief bearings of each country, but alſo facilitates conſultation by the marked diſtinction between land and water, which enables the eye to paſs more quickly to the other objects. The conſultation of charts might be facilitated in a ſimilar manner, while, in the uſual contraſt between maps and charts, the ſea might be preſerved white, and the lands diſtinguiſhed by ſtrokes, not horizontal, which would reſemble water, but vertical. In mineralogical maps the heraldic mode of engraving might be adopted,

reader

reader himſelf, for which purpoſe a liſt of the beſt maps is given at the end of the ſecond volume, affording materials for a ſelection of the great, of the middle, or of the ſmall kind. To the firſt claſs, for example, may be aſſigned Caſſini's map of France in one hundred and eighty-three ſheets, Ferrari's map of the Netherlands, and others of a ſimilar extent, more appropriated to public libraries and princely collections. To the ſecond claſs may be referred maps of kingdoms, from eight or ſix to four ſheets; while an atlas of the ſmalleſt ſize may include thoſe from four to one ſheet large folio; under which a collected atlas can be of no utility. Yet even of the latter a wonderful defect may be obſerved in the beſt private libraries, where, though a good atlas ſhould form the firſt object of inquiry and expence, as being uſeful in reading almoſt every deſcription of books, yet maps of the moſt antiquated and erroneous kind often appear; and even the literary investigator is ſatisfied with finding the name without exploring the fidelity of the general outline, or the accuracy of the poſitions.

With the advantages above enumerated, of new and important diſcoveries, of recent and authentic intelligence, and of the particular period of publication, there cannot be any great claim of merit in preſenting a more complete ſyſtem of geography, than has yet appeared in any language; for the Spaniards and Italians have been dormant in this ſcience, the French works of La Croix and others are too brief, while the German compilations of Buſching, Fabri, Ebeling, &c. &c. are of a moſt tremendous prolixity, arranged in the moſt taſteleſs manner, and exceeding in dry names, and trifling details, even the minuteneſs of our Gazetteers. * A deſcription of Europe in fourteen quarto

* The geographical ephemeris of Zach, (*Allgemeine Geographiſche Ephemeriden*,) a monthly journal in the German language, embraced aſtronomy and geography, and has contributed to the advancement of both ſciences. It is now conducted by Gaſpari and Bertuch, and more ſtrictly confined to geography; while Zach's new journal (*Monatliche Correſpondenz*) relates chiefly to aſtronomy.

volumes

volumes may well be contrafted with Strabo's defcription of the world in one volume: and geography feems to be that branch of fcience in which the ancients have eftablifhed a more claffical reputation than the moderns. Every great literary monument may be faid to be erected by compilation, from the time of Herodotus to that of Gibbon, and from the age of Homer to that of Shakfpere; but in the ufe of the materials there is a wide difference between Strabo, Arrian, Ptolemy, Paufanias, Mela, Pliny, and other celebrated ancient names, and modern general geographers; all of whom, except d'Anville, feem under-graduates in literature, without the diftinguifhed talents, or reputation, which have accompanied almoft every other literary exertion. Yet it may fafely be affirmed that a production of real value in univerfal geography requires a wider extent of various knowledge than any other literary department, as embracing topics of the moft multifarious defcription. There is however one name, that of d'Anville, peculiarly and juftly eminent in this fcience; but his reputation is chiefly derived from his maps, and from his illuftrations of various parts of ancient geography. In fpecial departments Goffellin, and other foreigners, have alfo been recently diftinguifhed; nor is it neceffary to remind the reader of the great merit of Rennell and Vincent in our own country.

With fuch examples the author confeffes his ambitious defire that the prefent work may, at leaft, be regarded as more free from defects than any preceding fyftem of modern geography. By the liberality of the publifhers no expence has been fpared in collecting materials from all quarters; and the affemblage of books and maps would amount to an expence hardly credible. If there be any failure, the blame muft folely reft with the author; who being however converfant with the fubject, from his early youth, when he was accuftomed to draw maps, while engaged in the ftudy of hiftory, and never having neglected his devotion to this important fcience, he hopes that the ample materials

 will

will be found not to have been entrusted to inadequate hands. He may affirm that the most sedulous attention has been exerted, in the selection and arrangement of the most interesting topics; and he hopes that the novelty of the plan will not only be recommended by greater ease and expedition, in using this work as a book of reference; but by a more strict and classical connection, so as to afford more clear and satisfactory information on a general perusal. The nature and causes of the plan shall be explained in the preliminary observations, as being intimately connected with other topics there investigated. It may here suffice to observe, that the objects most essentially allied with each other, instead of being dispersed as fragments, are here gathered into distinct heads or chapters, arranged in uniform progress, except where particular circumstances commanded a deviation: and instead of pretended histories, and prolix commercial documents, the chief attention is devoted to subjects strictly geographical, but which in preceding systems have often appeared in the form of a mere list of names, the evanescent shades of knowledge. Meagre details of history can be of no service even to youth, and are foreign to the name and nature of geography, which like chronology, only aspires to illustrate history; and without encroaching upon other provinces, has more than sufficient difficulties to encounter. The States are arranged according to their comparative importance, as it is proper that the objects which deserve most attention should be treated at the greatest length, and claim the earliest observation of the student.

In the Introduction Professor Vince seems to have omitted nothing in astronomy, or meteorology, that could in the least illustrate geography; and has carefully availed himself of the latest inventions and discoveries. For the botany of the several countries this work is indebted to Mr. Arthur Aikin, a zealous and intelligent cultivator of natural history. It may be necessary to remind the unlearned reader, that the Latin names in

in this part are unavoidable, becauſe plants not known in England muſt rarely admit of Engliſh appellations.

This work will, it is hoped, ſhew the progreſs of geography, in every part of the world, to the beginning of the nineteenth century; and when compared with any ſyſtem, publiſhed at the beginning, or even in the middle, of the eighteenth, the advances will be found to be prodigious. Many of the early ſyſtems were not a little injured in truth and perſpicuity, by the mixture of ancient and modern names, even in the maps; an abſurdity lately attempted to be revived by ſome French Authors: while in this ſtudy the modern ſtate ought always to claim the precedence, becauſe the genuine form of the countries, the windings of the ſhores, the courſe of the rivers, the direction of the mountains, and all thoſe parts in which natural geography receives aſſiſtance from natural hiſtory, are only aſcertained by recent obſervations; and upon this immutable baſis ancient geography muſt ultimately reſt. The modern delineations of many parts of Greece and Aſia Minor have thrown a light upon ancient hiſtory, which could never have been derived from theoretic geography, always uſeleſs, becauſe it cannot alter the face of nature; and often blameable, as by ſuppoſitions of knowledge, it impedes the progreſs of genuine obſervation, and patient diſcovery. In order to delineate the ancient ſtate of a country, it is indiſpenſable that the beſt modern maps be previouſly inveſtigated; by which proceſs alone can the ſites be accurately determined: and innumerable conjectures of Cluverius, Cellarius, and even d'Anville, have been overturned by the preciſion of recent knowledge. Yet the firſt elements of ancient geography are often inſtilled into the minds of youth from obſolete maps, in which the moſt important poſitions of natural geography, and ſometimes even the very points of the compaſs, are perverted; and from authors whoſe moſt radical opinions have been

overturned half a century ago! The proper progreſs is therefore to begin with the ſtudy of modern geography, which may afterwards be followed, with the greateſt advantage, by that of the ancient. The oppoſite courſe ſeems almoſt as ridiculous as it would be to commence the ſtudy of botany by the peruſal of Dioſcorides, and the Greek and Latin names of plants, without any acquaintance with their genuine characteriſtics and qualities. In general, genius may be cultivated by the ſtudy of ancient authors; but the grounds of any branch of ſcience are to be ſought in modern preciſion.

Amidſt other advantages already indicated, the regular references to the authorities, here obſerved for the firſt time in any geographical ſyſtem, will be admitted to be a conſiderable improvement, not only as imparting authenticity to the text, but as enabling the reader to recur to the beſt original works, when he is deſirous of more minute information*. Yet this improvement is ſo ſimple that the omiſſion might ſeem matter of ſurprize, were it not that former works of this nature will generally be found to be blindly copied from preceding ſyſtems, with the ſole claim of ſuperiority in error, as muſt happen in ſuch caſes, where miſtakes multiply, and an old hallucination becomes the father of a numerous progeny. The ſtrict quotation of authorities might alſo be rather dangerous in erroneous details; and the omiſſion is as convenient, as it is to paſs in ſilence geographical doubts of great importance, which might prove perilous ordeals of ſcience. Accuſtomed to the labours and pleaſures of learning merely for his own men-

* It is alſo to be wiſhed that writers on civil and natural hiſtory, &c. would on the mention of places otherwiſe minute and obſcure, indicate the diſtance and the quarter of the compaſs from ſome well known city, or other object, the bare mention of a name being often inſufficient, even for conſultation of the largeſt atlas. This defect often conſumes much of the reader's time, which might be ſaved by the addition of two or three words, with an improvement of the ſenſe, and no injury to the melody of the expreſſion.

tal improvement, as the delight of his eafe, the relief of care, the folace of misfortune, the author never hefitates to avow his doubts, or his ignorance; nor fcruples to facrifice the little vanity of the individual to his grand object, the advancement of fcience. An emphatic Arabian proverb declares that *the errors of the learned are learned;* and even the miftakes of a patient and unbiaffed inquirer may often excite difcuffion, and a confequent elucidation of the truth. Many blemifhes will no doubt, be found in a work of fuch an extenfive and multifarious nature; but thofe who are chiefly enabled to detect them will be the firft to pardon. The author can folemnly declare, that in a few cenfures which may be here found of fome miftakes in other works, he has in no inftance been influenced by any motive, except the pure wifh of prefenting exact information; fuch a detection of preceding errors being indifpenfable in a work of inftruction. But fuch paffages will be found extremely rare, as he has generally left it to the reader to detect the miftakes of his predeceffors, many of which are grofs and radical even beyond conception, by a mere collation of their defcriptions with thofe contained in the prefent work. Should the public favour reward the author's endeavours, he will moft fedulouffy remove any blemifhes, and adopt fuch real improvements as may be fuggefted. In the ftyle he has chiefly aimed at concife perfpicuity; and may have frequently facrificed elegance of ornament, or magnificence of period, to the fevere accuracy of the topic. Even the eloquence of Pliny feems oppreffed by the prolix minutenefs of geography, and ftruggles in vain, like a grand cataract, nearly arrefted by the froft of an alpine winter. Nay the moft decorated and concife of the ancient geographers is conftrained to begin with an apology. "I attempt to defcribe the ftate of the world, a work "full of impediments and difficulties, and which can fcarcely be enlivened "by one ray of elocution; for a great part will confift of the names of

"nations

" nations and places, with ſome perplexity even in the order to be fol-
" lowed; and the materials are rather prolix than alluring. The ob-
" ject is nevertheleſs grand, and important; and aſpires to the utmoſt
" dignity of ſcience; being, even in unſkilful hands, capable of invit-
" ing attention, by the contemplation of its magnitude*."

* Pompon. Mela de Situ Orbis, Lib. 1. init. Proœmii.

ADVER-

ADVERTISEMENT

TO THIS EDITION.

AT length the author has been enabled to complete his favourite plan, of prefenting to the public a fyftem of modern geography, duly proportioned in all its parts, and fuch as to offer harmony and uniformity in its various divifions and arrangements. For in the firft edition, reftricted to two volumes, a great portion of Afia, and the whole of America and Africa, had been neceffarily treated with fuch brevity, that there was no fpace even for the moft important and interefting geographical information. The ftriking brevity and deficiency of the latter half of the fecond volume were perceived abroad as well as at home; and the tranflators laboured by long notes, to fupply what the author knew, from experience, repeated reflection, and the moft fedulous examination of the fubject, could only be remedied by enlarging the arrangement. In a general fyftem of geography, intended for general information, it is indifpenfable that there be a harmony of the parts; and the author muft be an impartial cofmopolite, without predilection for particular portions. The account

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of his own country ought, indeed to be rather diffuſe, not from partial views, or national vanity, but to ſerve as an introduction to the reſt; it being neceſſary, in the firſt place, that the reader ſhould be intimately acquainted with his native ſoil. But in the others a ſtrict and impartial diſtribution ought to be obſerved, not only in imitation of the claſſical models of antiquity, whoſe examples are the ſafeſt to follow, as they have have ſtood the teſt of ſo many ages; but from the very nature of the ſubject, which requires that readers of all countries and purſuits, may find themſelves gratified by a due extent of information concerning any country which they may wiſh to examine.

At the ſame time it needs not be diſguiſed that, when the author compoſed the firſt edition of this work, he ſometimes laboured under a deficiency of materials, particularly recent Spaniſh books, of the utmoſt importance for the exact geography of their extenſive colonies, or rather empires, in America; but which, after the moſt careful reſearches, could not be found in this country. Zealous to remedy this defect, and at the ſame time to ſtudy with more advantage the preſent ſtate of geography in France, the only country which can rival England in this department, he went to Paris, where meeting with the moſt flattering and cordial reception from the moſt eminent men of ſcience, for which he muſt be permitted to retain laſting gratitude, he was enabled, not only to procure the Spaniſh authors wanted, but greatly to increaſe his fund of materials; and though detained by the well known events of the war much longer than he expected, he cannot deeply regret the occaſion, as ſcarcely a day paſſed without ſome addition to his information. Hence this edition, which ought to have appeared more than a twelvemonth ago, will be found to have gained in perfection what was loſt in delay.

The French tranſlation of this work, which was begun before the author went to Paris, and in which he took no concern whatever, not having

having ſeen one ſheet till the whole was printed, contributed by its great ſucceſs to open additional ſources. For many diplomatic men, and men of ſcience of all countries, communicated ſeveral articles which enrich numerous pages of the preſent edition. Nor can the French tranſlation be paſſed without the acknowledgment that, though there be many miſtakes for which the author is in no ſhape anſwerable, and which aroſe from the impatience of the publiſher, and rapidity of the execution to anſwer the public demand, yet the tranſlator, M. Walckenaer, is a man of property and information, far ſuperior to the uſual pretenſions of tranſlators, and has enriched the text with many valuable notes. The work is at the ſame time honoured by the excellent introduction of Lacroix; the reſpectable teſtimony of Fourcroy, the miniſter of public inſtruction, recommending it as the moſt complete and claſſical work of modern geography; by the reception of the abridgment in the academies of France, and the general ſucceſs of this ſyſtem in that enlightened country, rendered more remarkable in the midſt of war and national enmity. From ſuch enmities, men of ſcience are always conſidered as exempted and eſtranged; and nationalities would be unpardonable in a general geographer, whoſe firſt duty it is to view all nations with an equal and impartial eye; and the author muſt be permitted to expreſs his cordial acknowledgments for the liberal communications he has received from men of eminence in moſt countries in Europe, ſo that there now remain very few, of which the deſcription has not been corrected and improved by a ſkilful and diſtinguiſhed native.

Among the other ſtriking advantages of this edition, may firſt be mentioned, the ample account of New Spain, and of the Spaniſh viceroyalties in South America, drawn from the moſt recent Spaniſh materials, and preſenting, it is believed, the greateſt novelty of important information that ever appeared in any geographical work. The diſcovery of the

 preciſe

preciſe boundaries of the viceroyalties and governments has alſo enabled the author to inſert maps of various diviſions of South America, hitherto unattempted in any collection, though loudly demanded by the wide extent of that portion of the globe. Four other maps have been rejected, and their places ſupplied by others more correct, and better adapted to the preſent plan. The brief and defective accounts of the grand territory of the United States, and of the Weſt Indies, have alſo been enlarged, as their importance demanded; and the view of Africa more duly apportioned with the reſt; for, after long reflection and experience, the author has found that an exact ſyſtem of geography, of whatever ſize, ought to be divided into three parts; one for Europe; another for Aſia, which teems with civilized empires and ſtates, not to mention its vaſt extent, eſpecially when Auſtralaſia and Polyneſia are included, ſo as to amount to one half of the globe. Of the remaining third part, in the harmony of proportions, importance, and materials, at leaſt two thirds muſt ever be allotted to America, and the remainder to Aſrica when fully explored.

The reader may hence perceive that it would be impoſſible to add another volume to this ſyſtem of modern geography, without deſtroying the harmony and regularity of the whole edifice. If the volumes were found too large, they might, in a ſplendid edition, be divided into ſix volumes in quarto, with an atlas in folio, but any other diviſion would injure the unity of the arrangement. It may alſo be mentioned that an edition in ſix octavo volumes ſhould retain all the marginal indications, which form an eſſential part of the plan, as ſhewing that the work is not ſplit into fragments, like preceding ſyſtems, but forms one uniform narrative. In this reſpect the American editions are defective, as the plan is deranged, and often obſcured, by the introduction of thoſe indications into the text. The author is obliged to Dr. Barton for the honour done

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by his notes to the Philadelphia edition, but hopes and requeſts that no future editor will alter his text, on ſuch important topics as the origin of nations, which would be ſometimes to make him reſponſible for ideas long ſince diſmiſſed by men of ſcience, while a note on the paſſage would enable the reader to judge for himſelf, without implicating the judgment and character of the author.

In the large and juſt portions of this new edition, which are dedicated to the vaſt Spaniſh poſſeſſions in America, the moſt rich and ſurpriſing colonies known to hiſtory, it became neceſſary to give extenſive and independent deſcriptions, as the original works are not only very voluminous, and extremely difficult to be procured, but are wrapt in a language little ſtudied, ſo that a reference to them for more ample information, frequently admiſſible in depicting other countries, would here have been nugatory. But even in theſe lengthened deſcriptions, any unneceſſary prolixity has been carefully avoided; and it is hoped that no reader will object to the length, which is only cauſed by the variety and importance of the information, and which, from the confuſion of the original materials, it has required the moſt patient induſtry to digeſt and arrange. In ſome other parts of the work, the deſcriptions given by voyagers and travellers have been repeated in their own words, not from any momentary relaxation of indolence, for it would have been very eaſy to have thrown them into the hiſtorical form, but becauſe the juſt impreſſions made by the objects themſelves cannot be better repreſented than in the preciſe colours of the original painter; not to mention that the uniformity of the geographical ſtyle, lamented by Mela, and neceſſarily occaſioned by the recurrence of the ſame topics, may be greatly relieved by ſuch variations. Deſcriptions of manners, in particular, are always conveyed with more truth and nature in the words of the original obſerver; and as this work was charged with ſome deficiency in that department, by thoſe who did not enter into the ſpirit of the

geographical diſquiſitions, though more appropriated to the ſcience, ſeveral of the extracted parts belong to this diviſion. But however curious and intereſting the account of the ſavages of New Holland, and of the people of Otaheite, the laſt one of the moſt remarkable tribes on the globe, while the deſcription of their manners here repeated is, after the account of the Araucans by Molina, one of the moſt minute and ſingular, which has ever appeared in any language, yet when more ample materials ſhall ariſe, from important diſcoveries in Auſtralaſia and Polyneſia, a geographer would abbreviate theſe articles, and introduce other topics more ſtrictly connected with the ſcience. Meanwhile the account of the manners of the Polyneſians will not only gratify the moſt minute enquirer, but will ſerve to rectify many errors of Monteſquieu, and other eminent writers, with regard to a ſingular ſtage of ſociety.

To offer an apology for the improvements of this new edition may well appear ridiculous; but in the natural malignity of human nature, and the jealouſy of thoſe who wiſh to make geography a trade, it is not impoſſible that ſome may ſuppoſe that the author is influenced by the only motives of human action with which they are acquainted. Few enemies are ſo dangerous as thoſe who entertain a complete and deſerved contempt for their own characters, but in the wiſe diſtribution of nature it generally happens that malignity bears an exact proportion to the weakneſs of the inſect, who is conſcious that he would totally eſcape obſervation, were it not that he is venomous. Of ſuch detractors the author has heard, and muſt inform them to their ſurpriſe that he is greatly a loſer by this new edition, which is publiſhed in juſtice to the public, and to his own reputation. For the expences of his reſidence in France, the delay of long, ſedulous, and painful reſearches, and the purchaſe of numerous books and maps, far exceed the reward, however liberal. To readers of a very different deſcription, it may not be neceſſary to explain that nothing can be more

abſurd

abſurd in itſelf, and more inimical to the progreſs of all the ſciences, than to ſuppoſe that the firſt edition of a work is to be the ſtandard of all the others. Life is ſhort, and the health of a literary man often precarious. He ſtrictly performs his duty to any ſcience, and to the public, when he gives his extent of information at the time; but if his life be prolonged, and freſh materials of great importance ſhould ariſe, eſpecially at a period when the ſciences are making daily progreſs, he would fail in that duty if he withheld the communication. Among a thouſand examples, Mr. Kirwan's Mineralogy was at firſt reſtricted to one volume, but ſo rapid was the progreſs of the ſcience that he was obliged to extend it to two volumes; and met with deſerved applauſe for this additional attention to ſcience, and the ſervice of the public. It is difficult even to account for the origin of the idea, that the purchaſer of a firſt edition has a right to complain of any additions made in a ſecond. It has been long ſince obſerved that nothing is taken from him; and as there can never be a certainty of an author ſuperintending another edition, he can never have any deſign that his firſt edition ſhould be imperfect; nor could any ſuch example be produced in the literary hiſtory of any age. The natural feelings and innate ambition of an author prompt him, on the contrary, to render his work as perfect as poſſible, that it may not be ſupplanted by any other, but may convey his name to poſterity. Even in poetry and hiſtory the beſt authors have continued the correction and improvement of their productions to the lateſt hour of their exiſtence. Pope's Rape of the Lock, juſtly reputed one of the beſt of his poems, was tripled or quadrupled, after its first appearance, and the machinery of aerial beings introduced. We ſhould only have ſmiled at his weakneſs, if he had rejected theſe noble improvements, that the purchaſers of the firſt edition might not envy thoſe who had procured the others. Many of Voltaire's hiſtorical works are in the like predicament. If ſuch have always been the practice in the belles lettres, in works of ſcience it becomes indiſpenſable;

ble; and an author who ſhould neglect to avail himſelf, in any new edition of his work, of additional diſcoveries and materials, would be juſtly reprobated, and his work ſoon ſupplanted by a more complete ſyſtem. Far from any wiſh of an unneceſſary enlargement, the author has endeavoured, by numerous and often long notes, to reduce his abundant materials within as confined a compaſs as poſſible. But to give a complete and ſatisfactory deſcription of the whole world is no eaſy attempt; and the length muſt in ſome degree correſpond with the prodigious extent and infinite variety of the topics. On the other hand the author cannot, from experience, obſerve that any benefit would ariſe from a more detailed deſcription; which, if the harmony of parts were obſerved, indiſpenſable in ſolemn and claſſical compoſitions, could only be accompliſhed by doubling the extent of the preſent plan; and he doubts even if the pen of Gibbon could have recommended a ſyſtem of that extent, certainly too wide to excite general intereſt, and too prolix to be claſſical.

The novelty of the plan has met with general approbation at home and abroad, as more noble, ſcientific, and luminous, than any before projected.* Some would have preferred that the natural geography ſhould

* The ſentiments of an enlightened French critic, aud real judge, may not be unneceſſary in ſupport of this poſition.

"We have the pleaſure to announce a complete treatiſe of Geography, arranged in the moſt clear and methodical order, and preſenting all the moſt important and certain details, contained in the recent diſcoveries, and the labours and diſcuſſions of the moſt learned geographers of Europe, as far as the ſcience has yet advanced, with regard to the poſition, dimenſions, and configuration of the different parts of the globe. This ſyſtem contains the eſſence of the beſt works, ancient and modern; and the relations, ſometimes contradictory, of different travellers are compared, and weighed with judicious criticiſm; the authorities being at the ſame time carefully indicated: it preſents under the ſame point of view, and according to their degrees of importance, the political and commercial relations of the various nations of the earth; while the natural productions of all coun-

ſhould have ſtood firſt, but it is in fact, as is obſerved in the courſe of the work, only ſubſervient to the diſtribution and induſtry of mankind, forming the moſt intereſting department of the ſcience, which the natural hiſtory can never approach in dignity and importance. To the naturaliſt Kamſchatka, a peninſula reſembling Italy in form, and ſize, and volcanic ſoil, may perhaps appear as intereſting as the parent of empire and the arts; but in the eye of an hiſtorian or geographer there is no compariſon; and the natural hiſtory of an uninhabited country would become as it were a void; ſo that the reader muſt be allured by topics more generally and intenſely intereſting to the ſym-

tries are, for the firſt time, deſcribed according to the exact ideas, and the beſt ſyſtems, of naturaliſts. We thus announce to the geographer, to the politician, to the ſtateſman, to the merchant, to the traveller, to ſtudious youth, in fine, to men of all claſſes and all profeſſions, one of the moſt important and deſirable literary monuments, which has been publiſhed for a long time, and a work ever to be claſſed among the moſt uſeful and indiſpenſable.

"The great ſucceſs, with which it has been received in England, may be regarded as enſuring that of the French tranſlation; but it may not be unuſeful to mention, in a few words, ſome of the numerous advantages, which, independently of the novelty of the plan, and exactneſs of the execution, diſtinguiſh the Geography of Mr. Pinkerton from all the ſyſtems which have hitherto been publiſhed, or which daily iſſue from the preſs. The author being only intereſted in the diffuſion of inſtruction, and the advancement of the ſcience, has cited his authorities throughout, that the reader may judge of the employment of the materials which he has collected, the reſult of the ſtudies of twenty years. If he have compared with care the accounts of different travellers, in order to correct the one by the other, he has not ſhewn leſs exactneſs and labour in collecting the beſt and moſt recent maps; whence have reſulted many learned diſcuſſions on the moſt difficult points of geography, which not only tend to haſten the progreſs of that purſuit, but may enlighten the profeſſed geographer, and render the man of the world familiar with the moſt remote and unfrequented paths of that intricate ſcience. In the chapters relative to Hiſtorical Geography the author throws a new light on the principal topics of ancient geography, and that of the middle ages: and while he, ſometimes, oppoſes the opinions of the Danvilles, Goſſellins, and Rennells, he ſhews himſelf their worthy rival in combating them by arguments, which if they do not always diſſipate the darkneſs which envelopes theſe obſcure ſubjects, diſcloſe a vaſt erudition, and a profound knowledge of the ſcience, and may lead to new reſearches and important diſcoveries in this branch of literature."

pathetic

pathetic feelings of mankind, before he can peruſe the natural hiſtory with due attention and ſatisfaction. Some of the moſt important features are beſides ſo much changed or influenced by human induſtry, that to begin with the natural geography would not only occaſion many unneceſſary circumlocutions and anticipations, but would lead to fallacious views, as implying that ſuch was the ſtate of the country before it was poſſeſſed by any nation; while, on the contrary, the materials for this department depend on the utmoſt preciſion of recent knowledge and diſcovery, while we know little or nothing concerning the original natural hiſtory of any country; and of courſe to prefix this department to the hiſtorical would be ſomewhat prepoſterous.

The author has carefully availed himſelf of any candid critical remarks, which he fonnd in the literary journals, foreign and domeſtic, and has corrected ſome miſtakes indicated by them. Their eulogy of the ſtyle does credit to their own judgment, as in the opinions of foreigners, eminently verſed in the Engliſh language, ſuch is the purity of the grammar and expreſſion, that they were as ſeldom obliged to refer to a dictionary, as in any other production whatever of the Engliſh language; and the voice of foreigners muſt in this reſpect be regarded as an infallible teſt. Of the works handed down to us by antiquity not above one quarter is written in a laudable ſtyle. The others are preſerved by the importance or curioſity of the ſubject. Horace Walpole, Earl of Orford, who addreſſed to the author, his elegant letter on Graceful Compoſition, uſed to obſerve that when other faults required ſome ſkill to diſcover, it was the eaſieſt of all the offices of minor criticiſm to rail againſt the ſtyle of an author, but that if the cenſors do not produce numerous examples of bad ſtyle, they are no more to be regarded than village curs, who always bark after a carriage. The requiſites of a good

ſtyle are now ſo well known, and accurately defined, that ſome hypercritics, who commonly uſe a moſt miſerable ſtyle themſelves, remind us of the Scotch ſchoolmaſter in one of Smollett's novels, who came to London to teach the true pronunciation of the Engliſh language. If they live in a provincial town it is ſcarcely poſſible that they can be judges of ſtyle, of which the ſtandard has always been referred to the capital city; while, like owls in a barn, they can as little judge of the grandeur and dignity which a ſcience, formerly dry and pedantic, may aſſume by the nobility of a ſuperior ſtyle and arrangement. But the firſt proof of talents is to diſcern talents: and good judges are, as Pope has long ago obſerved, as rare as good authors. At preſent, perhaps that artificial and preciſe ſtyle, which, while it never ſinks into defect never riſes to beauty, nor ever aſpires to "thoughts that breathe and words that burn," is the moſt prevalent. While there are few painters, there are many eminent cabinet makers. The chief attributes of ſtyle are purity of grammar, an infinite fund of language, and nice diſcrimination of ſynonymous words, ſo that the word is preciſely made for its place, and could not be changed without injury to the ſenſe, the beauty or the melody; learned alluſions, which ſingularly delight the firſt and moſt enlightened claſs of readers; elegant and appropriated metaphors which ſurpriſe at once by their novelty and propriety; ſentences variegated with taſte and melody: and here and there a ſingle expreſſion, or even word, which, in the hands of a maſter, will irradiate a whole page. Above all, *keeping* is as neceſſary in compoſition as in painting. The dignified expreſſion of the text would become ridiculous in a note; but in the equality of cabinet making, a lobſter is deſcribed in the ſame language as a hero. The ſtyle ought alſo to be appropriated to the ſubject, and even to the length at which it is intended to be conſidered. Antiquities form a dry ſubject, of mere inſtruction, and the chief object is mathematical conciſeneſs; while the ſtyle of literary diſcuſſions on poetry

and the belles lettres can ſcarcely be too much decorated. Such would be the leſſons of our Walpoles, our Wartons, and our Gibbons, to many pupils who would aſpire to be maſters, who blame without being able to ſhew any cauſe of blame, and who ſuppoſe that a carpenter muſt be a ſupreme judge of architecture. Under thoſe great maſters, the author may boaſt of his education—and he alſo has been at the feet of Gamaliel.

The novelty in the manner of engraving the maps, while it is allowed to confer great clearneſs and beauty, advantages much to be valued as they expedite any reſearch, has by ſome eminent judges advanced in years, as Fleurieu and Bougainville at Paris, been regarded as objectionable, becauſe they found it difficult to read the words which are engraved on the ſea. This objection appeared to me to ariſe from miſapprehenſion; for to read, for any ſpace of time, many words engraved in that manner, would indeed fatigue and dazzle the eye; but a map is never read, being only conſulted for one or two poſitions at a time, ſo that no inconvenience can be experienced. It has alſo been ſaid that this manner is not new; as if the author, who has ſeen ſuch an infinite number of ancient maps, did not know that the ſea has frequently been marked with black lines drawn acroſs. But as juſtly might a Saxon coin be compared with a modern medal of Urbain or Hamerani; and the novelty does not conſiſt in drawing coarſe black lines, but in producing a grey tint, of a tranſparent and brilliant appearance, and ſo completely new that it cannot be executed, except by means of a machine, the invention of an ingenious living artiſt. There muſt therefore be a ſtrange confuſion of ideas, when the black lines of ſome old maps are compared with the grey tint here exhibited. Its originality further appears from the difficulty of the imitation, though frequently attempted ſince the publication of this work; the chief faults being that the lines are too wide, or too black, while it is a delicate grey hue which ought to be expreſſed.

Conceiving

Conceiving that the zoological part might admit of ſome improvements, in hands profoundly verſed in that ſcience, the author applied to Dr. Shaw of the Britiſh Muſeum, whoſe works have acquired a deſerved reputation at home and abroad. He has kindly lent his aid, as the reader will perceive from the Zoological Remarks at the end of each volume; thoſe on Auſtralaſia being of conſiderable extent, but authorized by the novelty, variety, and curioſity, of the animals of that region. Mr. Aikin has alſo reformed the botany, which in ſome inſtances was rather prolix and loaded with ſcientific terms, more fit for a profeſſed treatiſe on the ſubject than for a work of this nature.*

It has been uſual to make acknowledgments for ſervices received, but as ſcarcely a country occurs in which the author has not been ſupplied with original materials by learned natives, or travellers, a recapitulation of the names would be infinite, and he ſhall content himſelf with expreſſing his gratitude in general towards his literary inſtructors and benefactors, whoſe names are beſides commonly indicated in the deſcriptions of the different countries. No work probably in the whole circle of literature can boaſt of ſuch a number of reſpectable aſſiſtants, as the reader will judge on the peruſal: and it is diſmiſſed in the conſciouſneſs that no labour has been ſpared to gratify the public expectation.

* The Index, originally compiled by Mr. Ayſcough of the Britiſh Muſeum, has alſo been revised, enlarged, and improved.

MEMOIR

ON THE

RECENT PROGRESS, AND PRESENT STATE, OF GEOGRAPHY.

THE progreſs of geography has begun to intereſt all ranks and profeſſions of mankind, and to be apparent even among ſome nations who have hitherto rather neglected the ſciences. Notwithſtanding the ſplendour of Strabo, Pliny, and other great claſſical writers on this ſubject, the ſcience had till lately rather aſſumed the dry mathematical forms of Ptolemy; and writers, without talents or ſelection, had buried in dull pedantry topics capable of the moſt ſeductive amuſement, and the moſt profound inſtruction. Juſtly become an indiſpenſable branch of education, it now attracts the attention of the fair pupil, as well as of the future ſtateſman, warrior, or philoſopher; and its progreſs by opening new intercourſes, and abating national prejudices and animoſities, may be ſaid to contribute in no ſmall degree to the improvement and happineſs of the human race.

But as this important ſcience had been generally treated in modern times, as a mere auxiliary of hiſtory, in a pedantic and repulſive manner, without the dignity and infinite variety which ſo grand a theme deſerved, and ought to have invited, there is the leſs wonder that it has rather been neglected among thoſe very claſſes, where it might have been expected to have been the moſt diffuſed. It could hardly have been ſuppoſed that a learned geologiſt ſhould imagine that New Holland is near the northern pole; yet this is no ſolitary inſtance, for even recent writers on aſtronomy, natural philoſophy, and natural hiſtory, often betray an unexpected unacquaintance with this ſcience, which ought in a great meaſure to guide their reſearches.* To inſtance another

* It is ſaid that in ſucceſſive editions of the *Neceſſary Tables*, Anvers was put under one latitude and longitude, and Antwerp under another.

other claſs, it is ſcarcely poſſible to conceive that a miniſter or ſtateſman ſhould be ignorant of geography, a ſcience, without which, neither military operations can be directed or arranged, diſtant poſſeſſions worth acquiſition indicated, nor even pacific negotiations conducted with ſuch accuracy as to preclude future diſputes. The treaty of Utrecht was the work of very able negotiators; yet the ſeeds of war were laid from mere ignorance of geography, for, in defining the French and Portugeuſe poſſeſſions in South America, the river Oyapok was confounded with that of Vincent Pinzon, though at the diſtance of thirty leagues. The Duke of Newcaſtle is ſaid to have eagerly inquired, "in what part of Germany is the Ohio:" and in the diſpute concerning the navigation of the Scheldt, a later miniſter could not diſcover that river in the map, becauſe it was written L'Escaut.

To render geography worthy of being peruſed by ſtateſmen and men of ſcience, which could only be done by treating it in the views of a ſtateſman and a man of ſcience, was no ſmall object of the preſent deſign; and if the author may truſt many literary journals, and letters from diſtinguiſhed perſons of various countries, he has ſucceeded. Eminent diplomatic characters have contributed with zeal to the advantages of this new edition; and it is hoped that the ſtatiſtic part will be found, like the others, to have received great improvement. But it would be laudable to attach archives or offices of geography, conducted by able proficients, to the charges and reſidencies of miniſters, to ſupply the moſt recent and authentic intelligence, and prevent the poſſibility of miſtakes, which may prove of great and laſting detriment.

After theſe brief conſiderations on the utility and importance of the ſcience, regarded in rather a new point of view, it will be proper to chuſe the epoch at which the preſent memoir ſhall commence; and a more proper cannot be ſelected than that of the death of d'Anville, 1782. Only twenty-four years have elapſed ſince the death of that great geographer, but how pregnant with important voyages and diſcoveries, and geographical improvements of every kind!

An able work on geography may be ſafely pronounced to require greater labour, and more various knowledge than any other human production, as it is the only ſcience which unites the mathematical department with the political, ethical, hiſtorical, phyſical, and deſcriptive. No wonder then that it ſhould be rare to find mathematical knowledge, and the capacity of drawing faithful and elegant maps, united with ſkill in the learned and living languages, and the talent of writing a clear and preciſe diſquiſition. Hence the ſuperlative and juſt reputation of d'Anville, whom to have learned to venerate is already to have made

ſome progreſs in the ſtudy. Aſſiſted by the munificence and communications of the great, and the correſpondence of the learned, he became maſter of all the materials to be found in his time; and uſed them with ſuch ſedulous labour, and minute accuracy, that his works will ever form a memorable epoch in the hiſtory of Geography. Even of the countries, where the greateſt improvements have ſince been made, his maps may always be compared with pleaſure and advantage, as they ſerve to ſhew the limits of knowledge at the time when they were compoſed.*

But it were abſurd to unite the epithet of perfect with any production of man. In ancient geography, d'Anville was often miſled by vague ſimilarities between ancient and modern names, not being ſufficiently converſant with the hiſtory and literature of the middle ages, which often overturn ſuch idle ſpeculations, by marking the erection of the modern city, or commencement of the modern appellation. A ſtriking inſtance may be found in his confounding the Bergos of Pliny with Bergen in Norway, which was founded in 1069; and by ſome unaccountable fatality, he has implicitly adopted the crude ideas of Cluverius and Cellarius, concerning the ancient knowledge in the north of Europe, not to mention his aſſigning too great an extent to their diſcoveries in Aſia and Africa. In modern geography d'Anville has often neglected the mountains, though a more prominent and greater feature of nature than the rivers, and more diſtinctive of the hiſtory and progreſs of nations. A ſtranger at the ſame time to a new ſcience which began to dawn, that of orology or ſcientific deſcriptions of great chains of mountains, d'Anville has often placed at random little detached mole-hills, which can never delineate the nature or breadth of chains of mountains; ſometimes, like the Andes, preſenting a vaſt belt or table-land of four thouſand miles in length, and from one hundred to two hundred in breadth. It is ſurpriſing that, as all accurate maps in general geography are reduced from larger ſurveys, the far ſuperior advantages of the recent plan, accuracy, perſpicuity, and beauty, above all a true and juſt repreſentation of nature, did not impreſs this great geographer. Of late however, his countrymen have made great progreſs in this new improvement, for in the map of the French empire, publiſhed in 1804, at the *Depot de la Guerre*, the projection of the mountains is carried to the utmoſt perfec-

* D'Anville drew all his own maps with ſingular neatneſs. His executors preſented to me a ſpecimen, which I keep as a precious relic. He never had an eleve, and of courſe could leave none.

tion,

tion, attainable on a ſmall ſcale, being a complete miniature of a large topographical ſurvey.*

A valuable catalogue of all the works of d'Anville was publiſhed at Paris in 1802, with an eulogy by M. Dacier, to which the reader may be referred. Suffice it here to obſerve, that to his other talents was joined a ſingular ſagacity in fixing doubtful poſitions, ſo that by the voyagers in the Moluccas and in Egypt, his ſkill was equally admired. He was born at Paris in 1697, and died there on the 28th of January 1782, at the advanced age of eighty-four years. It is ſaid that this able geographer, whoſe exact eye pervaded the globe, had ſcarcely or never paſſed the barriers of his native city. The purſuits of a geographer, though intimately connected with thoſe of the traveller, can be little forwarded by perſonal journies or voyages; and the brevity of human life, will not permit geography to derive great advantage from ſuch exertions; for as a geographer cannot employ, with Sauſſure, forty years in the examination of the Alps, nor ten years in every country of the globe, he muſt, with the bee ſuck honey from every flower, inſtead of ſpinning his own web like the ſpider. His prerogative, like that of the architect, is to erect a ſolid and elegant edifice from materials already prepared.

On the continent, where venders of maps are not ſtyled geographers, d'Anville had the title and penſion of geographer to the king, and enjoyed the advantages as well as the glory attached to his talents. His moſt important maps and memoirs appeared between 1740 and 1770. One of his chief works, his Ancient Geography, was publiſhed in 1768; but as he has ſtyled it an abridgment, he has treated the ſubject in a manner too dry and conciſe, and it might not be difficult at the preſent period to produce a ſuperior treatiſe. Some of his firſt maps were conſtructed for Rollin's Ancient Hiſtory; and he ſeems to have retained a predilection for the erudition of ancient geography. It muſt be underſtood, that the dates in d'Anville's maps do not imply that he made no later improvements, for ſome were retouched long after. Thus the coaſt of Greece, publiſhed in 1756, was retouched in 1779. In that of Aſia 1751, there are improvements 1763, and even 1780. Africa 1749 was retouched 1770, and 1777. North America 1746 has various improvements, the lateſt 1761. South America 1748 has corrections as late as 1779. All theſe improvements are indicated in the catalogue of his works; where it is alſo obſerved that his map of Quito 1750,

* Among the firſt ſmall maps of the orologic kind, were thoſe which I directed for my Enquiry into the Hiſtory of Scotland 1788.

four ſheets, is the rareſt and moſt curious of all his productions, the copper and impreſſions having been purchaſed by the king of Spain, ſo that it was believed that only one copy exiſted in France, that in d'Anville's own collection of maps, now in the archives of the miniſter of foreign affairs. But I was ſo fortunate as to procure a copy or two at Paris, with its original accompaniment, unknown to the author of the catalogue, namely a memoir of Condamiue on the pyramids erected by the mathematicians in Quito, to commemorate the admeaſurement of a degree of latitude, but which being offenſive to the king of Spain, were ſoon deſtroyed; and as the memoir of Condamine is written with ſome aſperity, this was probably the real cauſe, that all the impreſſion was bought and ſuppreſſed by orders of his Catholic Majeſty.*

It is not unworthy of obſervation that, about the preciſe period of the death of d'Anville, Rennell firſt began his celebrated career, and introduced the ſcience of geography into England, in a form at once inviting, exact, and ſcientific, by his memoir and map of Hindoſtan. But as the works of d'Anville have been aſſumed as forming the firſt epoch in this little memoir, it will be more proper and connected to purſue the progreſs of geography in France, before tracing its ſteps in England and other countries.

In ancient geography d'Anville was ably ſucceeded by Goſſellin, whoſe Analyſis of the Greek geography appeared in 1790. No preceding writer had ever entered, with ſuch ſkill and patience, into the laborious and intricate paths of ancient mathematics and aſtronomy, which are ſtrictly connected with ancient geography. The itinerary meaſures, the menſuration of the earth, the ancient aſtronomical obſervations, the ideal zones, the climates as denoted by the length of the day, all preſented topics of ſedulous inquiry, and anxious reſearch. At the ſame time drawing maps with a neatneſs equal to that of d'Anville, and conſtructing long numerical tables with vaſt labour; his indefatigable love of ſcience would appear incredible to thoſe who do not feel the ſame paſſion. His ſtudy of the ancient theory of climates and zones has enabled him to explain why Ptolemy has contracted the extent of Hindoſtan towards the ſouth, as, if Ceylon had been placed in the torrid zone, it would have overturned the ancient theory, that the torrid zone was totally uninhabitable; and why the ſame geographer has bent Scotland towards the eaſt, as otherwiſe the moſt northern cape would have paſſed the climate of Thule, where, the longeſt day, being twenty hours, in-

* The works of d'Anville are now ſold by M. Demanne at the Imperial Library at Paris, and the collection coſts about ſeven or eight guineas. If purchaſed elſewhere, it ſhould be obſerved if the maps have the lateſt improvements.

dicates a latitude of nearly 63°; the radical error arifing from his having raifed the latitudes of England three degrees and a half too far to the north; and as Ptolemy knew that Thule was to the north of Britain, he was obliged, in order to preferve his theory, to fuppofe that Scotland bent towards the eaft *. It is needlefs to remind the learned reader, that this circumftance had embarraffed geographers and antiquaries for two centuries and a half; whence the utility of M. Goffellin's new views of ancient geography may be conceived. In his grand work the Analyfis of Greek Geography, M. Goffellin has, with great ability, demonftrated the fallacy of various opinions concerning the extent of ancient knowledge in the eaft; and has afcertained, that the extent of that knowledge did not pafs the weftern parts of the kingdom of Siam, the Golden Cherfonefe being Pegu, and not Malacca as d'Anville had fuppofed. With fuch merits the name of Goffellin will pafs to the lateft pofterity, as a great and folid improver of ancient geography; and his illuftrations of the recent tranflation of Strabo will add to that reputation: and though, in his work on African Geography, and on fome other occafions, he have too much reftricted the knowledge of the ancients, yet his manner is fo profound and precife, and his arrangement fo luminous and elaborate, that thofe who are able to controvert his opinions will be the firft to admit his fuperior merits; and if he err, it is on the oppofite fide to erroneous doctrines, fo as to leave the truth in the middle, and to fupply many weapons for its eftablifhment.

After this juft diftinction due to the firft living geographer in France, it will not be neceffary to enlarge concerning the others. Buache, geographer of the marine, poffeffes eminent fkill in modern geography, fo far as it extends to a wide acquaintance with maps and charts of all countries and feas, and communicates his knowledge with great liberality. But a love of theory, which feems inherent in his name and family, leads him to fpeculations in ancient and modern geography, which rather imply a love of paradox than of truth; and if one of his paper kites fall, he will foon let fly another, which, far from being armed with the electricity of fcience, or of bringing the lightning of truth from heaven, is rent by the firft breeze of oppofition. M. Barbié du Bocage drew the beautiful maps for the *Voyage d'Anacharfis* under the eyes of Barthelemy, chiefly from drawings taken on the fpot by orders of the count de Choifeul; but feveral parts and plans have been fupplied from imagination, and even that of Athens has been found to differ confider-

* *Lettre de M. Goffellin à M. Pinkerton*, in the appendix to the *Recherches fur les Scythes*, Paris 1804, 8vo.

ably

ably from the truth. M. Barbié has however a learned library, and is not a little induſtrious, ſo that his reſearches are often uſeful and ingenious; and poſſeſſing the modeſty of real ſcience, he is little obtruſive of his opinions. When I left Paris he was uſefully occupied in preparing the maps for the ſecond volume of the Count de Choiſeul's Picturesque Journey through Greece; and had executed for the government a large and curious map of the Peloponneſus, in which however, ſome of the topography, though laid down with the apparent minuteneſs of truth, was only imaginary, a practice which muſt be blamed, as it would be better to leave a blank.*

When to theſe names is added that of Coquebert, who has hitherto been more diſtinguiſhed for his geographical knowledge than for his publications, it would be difficult to add any rivals. Quacks abound, as uſual in all countries, but their natural reward is oblivion.†

But

* In his map of the plain of Troy, publiſhed in the edition of the Voyage d'Anacharſis 1799, he confeſſed to me that he had, by mere miſtake, placed the river Thymbrius on the wrong ſide of the Simois.

† As Lagrange and Mechain, (the latter ſince dead of the yellow fever in Spain,) are aſtronomers of the firſt merit, ſo La Lande was rather conſidered as an uſeful compiler; but his repeated trifling letters to the journals, and his lectures on the Pont Neuf, contributed, with other circumſtances, to ſubject him to a charge of *charlatanerie*. Yet more ſubject to the ſame charge is Mentelle, formerly, by intrigue, geographer to the count d'Artois, and now, by intrigue, member of the Inſtitute, and teacher of the new princes. Deſtitute alike of talents and ſcience, the art of Mentelle, like that bird that feeds on the excrements of others, is to copy and diſguiſe the labours of d'Anville, Goſſellin, and other able inquirers; often with ſuch a multitude of miſtakes, and confuſion of ideas, that the very perverſion gives them, to the unſkilful eye, an air of novelty. Sometimes after copying a whole ſyſtem of Goſſellin, as being ſtrictly his own, he will ſlightly mention the real author at the end, and requeſt indulgence for having combated his ideas! After d'Anville had, with the uſual preciſion of real ſkill, ſeparated ancient and modern geography, which again to blend together, would be to forget the hiſtory of the middle ages, and to confound the whole ſcience, no writer but Mentelle would have ſought to have diſtinguiſhed himſelf by reviving the ancient pedantry, as he has endeavoured to do in his *Geographie Comparée*. His *Cosmographie*, a word which he alone would chuſe to apply to geography, and his edition of Voſgien's Dictionary, ſwarm with ſuch errors as would diſgrace a ſchool boy. In the MS. of the latter I counted four groſs errors in three lines. In conjunction with Chanlaire, a lawyer who had amaſſed ſome money and only furniſhes the funds, Mentelle has publiſhed what he calls an Atlas, of which a judgment may be formed from the phyſical map of Germany, in which the ſandy plains on the Baltic, where there is not even a hill, are thickly ſet with chains of mountains, higher than the Alps! When I aſked him the reaſon of this phenomenon, he anſwered with the profound gravity of a profeſſor, that in geography, no axiom could be more certain, than that high mountains always accompany great rivers. Piqued at his being unmentioned in the firſt edition of this work, upon the appearance of the French tranſlation, he had the effrontery to ſet his name to a miſerable compilation of modern geography in fourteen vols. 8vo, which one Brun, a young Dane who had left his country, and been glad to live as an amanuenſis at Paris, had compiled and tranſlated from various German authors, in ſo chaotic a manner, that it was juſtly ſtyled, a good deſcription of the world before it was made. This compilation of a Daniſh youth, baptized with the name of Mentelle, was oddly enough ſtyled the *French Geography*, and loudly trumpeted in oppoſition to this work, which was, as they thought invidiouſly, but really honourably, denominated the *Engliſh Geography*. All the dependents and flatterers of the new government applauded this French geography, and condemned the purchaſers of the Engliſh Strabo, as the friends of this work choſe to call it, as incurable

But many of the moſt beautiful and ſolid productions of the French geographers have, during the laſt and preſent century, been executed by orders of the government. Not to mention the grand map of Caſſini, which was only completed in 1794, what are called the *Cartes des Chaſſes*, the maps of the royal hunts, or foreſts, form the moſt beautiful and ſingular monument of the kind which has ever appeared in any country. It is ſaid that the engraving of each map coſt four hundred louis d'or; and they certainly deſerve it, for the beauty, harmony, exact and minute delineation, and elaborate accuracy, far ſurpaſs all deſcription. For each department, wood, water, hills, fields, &c. &c. a ſeparate engraver, eminent in his particular line, was employed. Of the twelve deſigned, only eight were finiſhed before the ſubverſion of the monarchy; but the remaining four now proceed with all poſſible expedition *. Speaking of theſe models of beautiful engraving, it is to be regretted that the prices of maps do not approach nearer to thoſe of other engravings, as the publiſher would then be enabled, by higher rewards to the artiſts, to obtain more neatneſs and elegance.

From the *Cartes des Chaſſes* the tranſition muſt be violent to any other geographical engravings, but the laudable attention of the ancient government to this intereſting branch of ſcience, retains its beneficial effects, and important maps are frequently publiſhed at the *Depot de la Guerre*, and the *Depot de la Marine*. Many of them are excluſively reſerved for the uſe of the French generals and admirals; the former in particular, by the exactneſs of the topography, affording great advantages to military operations. The map of Suabia, the propoſed map of Holland on the ſcale of Caſſini, and of Egypt in fifty ſheets, are monuments which do honour to the ſcience †. At the *Depot de la Marine*, are the engravings for the remaining part of the Voyage of Entrecaſteaux, ready for publication. He has accurately ſurveyed the S. W. coaſt of New Caledonia, which is wanting in our maps, and ſeems to conſiſt of a range of

incurable *Anglomanes* and enemies of France. This railing ſtill continues in the French journals, and M. Brun is ſo kind as to help himſelf upon the occaſion, loudly declaring (*Journal de l'Empire* 10 June 1806,) "qu'un Anglomane eſt encore pire qu'un Anglois!" In like manner a far more reſpectable author, Cambri, chuſing to revive in favour of France, the exploded dreams of the Celtic power and empire, has repeatedly inſinuated that I was hired by the Engliſh Government to write my Diſſertation on the Goths; in which the ancient power of the Celts, that is, as he erroneouſly ſuppoſes, of France, has been reſtricted to its proper narrow bounds.

* They were never ſold, being only deſigned for preſents; and are very rarely to be met with, as if the king hunted during ſnow or rain, two or three copies might be deſtroyed.

† The *Memorial Topographique et Militaire*, publiſhed by the *Depot de la Guerre*, muſt not be forgotten. The firſt three or four numbers 8vo. contain ſeveral excellent papers on the projection of maps, and the progreſs of geography. The grand map of the campaigns of Bonaparte, by Bacler d'Albe, is now finiſhed, and includes Italy and Sicily. The author ſaw many of the materials, and can add his teſtimony to the general opinion of its accuracy.

mountains.

mountains. Half the ſouthern coaſt of New Holland alſo appears, but the eaſtern half remains hidden with the labours of Flinders and Baudin, the latter of whom was little adapted to ſuch an expedition, his ſole recommendation having been his intereſt with one of the directors of the then government. The ingenious mineralogiſt who accompanied Baudin informed me, that that part of the ſouthern coaſt of New Holland, which was unviſited by Entrecaſteaux, and which approaches nearest to Diemen's Land, preſents two conſiderable bays, that towards the eaſt, if I remember right, having a conſiderable iſland at its entrance, called the Iſland of Kanguroos, while towards the weſt there is another bay with an iſle ſo near the bottom, that though it may be circumnavigated, it appears united with the land. New Holland, or Notaſia, for men of ſcience have begun to adopt the latter term, does not appear to be interſected by any ſtrait or ſtraits, as was ſuppoſed; but to form one continent, or vaſt extent of land, inſulated like the other continents; for Aſia, Europe, and Africa, form in fact an inſulated continent, like North and South America.

One of the lateſt improvements, which begins to paſs gradually into geography in France, is not only to aſcertain the height of mountains, but that of the vaſt plains or expanſes of country, which ſlope in various directions, chiefly towards the great rivers, and preſent various aſpects and altitudes. That excellent mineralogiſt Daubuiſſon, lent me in MS. his curious obſervations on thoſe of France, but as he will probably publiſh them, I do not wiſh to anticipate his labours.

This brief view of the preſent ſtate of geography in France, cannot be cloſed without honourable mention of the able treatiſe on the ſphere by La Croix, compoſed as an introduction to the French tranſlation of this geography. From the judicious manner in which the author has treated the ſubject, conſidering aſtronomy merely ſo far as connected with geography, laying down clear rules for the projection of maps, and treating the other topics in the moſt luminous and popular manner, it may ſafely be pronounced the beſt of the kind which has ever appeared, and a maſterpiece in that department of ſcience.

The progreſs and preſent ſtate of geography in England next claim conſideration. It has already been obſerved that, about the time of the death of d'Anville, 1782, Rennell was the firſt who opened the ſources of genuine and ſcientific geography in England. Before his time this great commercial country, to which the ſtudy was more eſſential than to any other in Europe, had oddly applied the names of geographers and hydrographers to compilers and venders of maps, moſtly mere copies of the French, or common ſurveys of Engliſh counties; while in France, from the

the middle of the ſeventeenth century, the Sanſons, the Deliſles, d'Anville, men capable of writing with great learning in the Memoirs of the Academies of Sciences and Belles Lettres, or of publiſhing elaborate memoirs, had alone been dignified with the titles of geographers and hydrographers to the king. This confuſion of ideas is wholly unaccountable, for as well might the printer of a poem be created poet laureat.* If juſt and preciſe ideas of the dignity and importance of the ſcience were at length to dawn, we ſhould ſee Rennell appointed geographer to the king of Great-Britain, and Dalrymple hydrographer, with yearly ſalaries of at leaſt five hundred pounds, far better beſtowed than on worthleſs ſycophants; for the places would be ſo far from being ſinecures, that from the labours of the poſſeſſors, no ſmall glory and advantage would ariſe to the nation. The very names of our royal geographers and hydrographers are totally unknown in the hiſtory of the ſcience; and it would be idle to evocate their ſhades, or rather ſhadows of a dream, in order to demand their pretenſions. Servile copiers of French maps, and even thoſe often antiquated, they only ſerved to degrade the ſcience and the national reputation. So conſcious of this was Gibbon, a man deeply embued with many ſciences, that he employed d'Anville to draw a map worthy of his hiſtory; but which, owing to the commencement of the war 1778, was never completed. Before Rennell opened the gate of the temple, the porch had been filled with mere venders, who, with the uſual mercantile ſpirit, ſhewed great jealouſy of their little trade: and conſcious that it required neither talents nor induſtry, wiſhed to conceal the extreme eaſe of the proceſs, and thus threw myſtery and obſcurity around a plain and perſpicuous ſcience. Each was jealous of his little monopoly, and anxious to hide the ſources of his information, nay would affect to rail againſt the labours of the very authors of it; as we have ſometimes ſeen our men of letters impeach Voltaire, though he was the firſt and only cauſe of diffuſing the knowledge and glory of Engliſh literature through France, and the continent of Europe. But when ſhopkeepers had become geographers, how was it poſſible to avoid theſe infallible conſequences, and procedures merely mercantile, inſtead of the noble and liberal views of men of ſcience, only anxious for their own reputation and that of their country?

To quit this diſagreeable theme, and return to the real progreſs of geography in England, it muſt not be forgotten that when, though rarely, the French maps of Deliſle and d'Anville were not copied, yet to

* Or Meſſieurs Cadell and Davies, who publiſhed the works of Hume, Robertſon, Gibbon, inſcribe on their door, *Hiſtorians to His Majeſty.*

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the disgrace of the country, Frenchmen were employed; and our royal geographers never thought of exciting native talents, though it would be very difficult, at any epoch, to trace the employment of a single Englishman in any department whatever at Paris. Among the French employed in London some distinction is due to La Rochette. Acquainted with him for many years, I must say that he had a real tincture of the science. To a select library of books of geography, voyages, and travels, he united a considerable spirit of research; and spared no time nor labour in order to obtain the praise of correctness. It was idly reported, that he had been an eleve of d'Anville, while that great geographer never had an eleve, and La Rochette candidly informed me that he could only say that he had seen d'Anville. His life may be said to have passed in labour, poverty, and domestic calamity. His drawings were in general neat, elaborate, and correct, so far as his judgment and materials extended; yet he was refused one hundred guineas, which he demanded, for a drawing of the world for a projected globe, and the sum was reprobated as exorbitant! He told me that all his demands were regulated, as, contented with a mere existence, a certain daily pittance, he compared this with the time to be employed, so that his payments were upon an uniform standard. Among his chief productions are his map of Hindostan, and that of the marches of Alexander the Great. But as his reading was far from being universal, or even extensive, he would sometimes supply the want of materials or information, by a pretty and picturesque neatness, which at the first glance strikes as imaginary, and unlike the face of nature. Nor could I persuade him to adopt the genuine geographic plan of delineating the chains of mountains; but he continued the antiquated manner of detached molehills, while he might as well have represented rivers by dotted lines*. He pleaded as an apology that his maps were crowded with names, and that he could not find room; but did not reflect that he was sacrificing the grandest features of nature to the names of miserable villages, unknown in history civil or natural, and which, if unexpectedly called into notice, might be easily found in larger surveys. La Rochette however can never be classed among the learned geographers, as I recollect no memoir which he has published; his learning was limited, and his judgment and sagacity far from laudable, nor was he free from

* Lacroix, Introd. to this Geography p. clxvi, has justly observed, that this way of indicating mountains is wholly vague and insignificant, as instead of shewing the direction and branches of the chains it only says 'here are mountains'. La Rochette even confessed to me that he sometimes put in mountains when he had nothing else to fill the map. I begged that he would in future prefer another old plan, that of inserting elephants and ostriches.

that jealouſy which accompanies trade, not ſcience: for as his materials conſtituted his ſole merit, he was ſhy of communication, while a man of ſcience is commonly frank and open; for he knows that he can lend his materials, but cannot lend his talents.

It would be uſcleſs to retail the various truly ſcientific productions of Rennell, for his name alone will recal them to the memory of every reader. To indicate ſmall faults, where there is ſo much merit, would be invidious; and it is better to ſay, as Bolingbroke did of Marlborough, "he is ſo great a man that I have forgotten his faults." But the public voice has gently whiſpered that the treatiſe on the geography of Herodotus is too prolix by one half. Books ſhould be appropriated, by a ſcale of taſte and judgment, to the natural extent and importance of the ſubject; otherwiſe, in the language of ſcripture, 'the world would not contain the books that might be written.' As it is not too late to amend this defect, (in fact the only reaſon why it is here mentioned), it is to be hoped that the excellent author will not thus evaporate his future labours, which are anxiouſly expected, but will ſubmit them to the numerous eraſures of ſome learned friend. Nor in candid criticiſm can Dr. Vincent's work on the voyage of Nearchus, and the Periplûs of the Erythrean Sea, be exempted from a ſimilar charge; and the work is beſides more laudable in the attempt than in the execution, the author being more converſant in the claſſics, and their commentators, than in the progreſs and recent improvements of the various ſciences.*

The various treatiſes on the plain of Troy, lately publiſhed in England, deſerve mention, as contributing many new improvements of ancient geography. This intereſting topic will ſpeedily be further illuſtrated, by the appearance of the ſecond volume of the Count de Choiſeul's Picturesque Journey through Greece, Chevalier, who led the way to this inquiry, having only been employed by that nobleman.

Of the new grand Survey of England and Wales, the part beginning with Eſſex has appeared, and has fully anſwered the public expectation. It is executed at the Tower by ſelect draftſmen and engravers. It is to be regretted, that the county of Kent was permitted to be taken off

* I am much obliged to Dr. Aikin, for the abridgment which he has publiſhed of this work with ſome variations, but which are in fact retrogreſſions, in the arrangement, under the title of *Geographical Delineations*; but I ſhould have been more obliged to him if he had once mentioned my name. He may however be aſſured, that ſo numerous are the improvements, unknown before my firſt edition, that no man moderately verſed in the ſcience has ever miſtaken, or can miſtake, the ſole ſource of his information, there not being above ſix pages of matter not to be found in that firſt edition. He ſhould have read the diſſertation of Deliſle, "On the means of detecting plagiariſm in geography."

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the plates, as it ſerved to diſtract and foreſtal the public opinion, and produce miſapprehenſions concerning the nature of this grand deſign, which is not a ſeries of counties, but a general trigonometrical ſurvey of England. Caſſini would never have permitted ſuch an injudicious diſturbance of the original arrangement.

In ſome ſmall maps of the Engliſh counties, ſome large maps of England, and in ſome of thoſe deſtined for one of the Encyclopedias, a ſingular novelty has been introduced, which, if continued, threatens to overwhelm the art with barbariſm, and cannot be too ſeverely reprobated. This wonderful improvement conſiſts in engraving almoſt all the names of places in Roman characters, ſo that the eye, inſtead of the harmony and repoſe always eſteemed indiſpenſable in beautiful engravings, is dazzled and repelled with diſguſt, from the ſharpneſs of theſe characters; while, in the confuſed uniformity, ſcarcely can a name be found or diſtinguiſhed from another. The next ſtep, perhaps, may be to print maps with moveable types, which would be more ſoft and agreeable to the eye than the ſharpneſs of the Roman letter when engraved. That form of character has, on the contrary, been rarely admitted by maſters, who often prefer a line drawn under a remarkable name: for they knew well that in an engraving, the eye is pleaſed with ſoftneſs and repoſe, and hardneſs is regarded as the worſt of all defects. Beſides the confuſion, which is ſuch that four minutes are required to find, what in another map would be caught in an inſtant, there is alſo an air of meanneſs and negligence; for the beauty of a printed page conſiſts in the regularity of the lines, but to take detached words and ſcatter them over a page, though preſenting an accurate reſemblance of theſe maps, except its ſuperior ſoftneſs to the eye, would have an effect which may be eaſily gueſſed by the reader. It is hoped therefore that the ſoftneſs of the Italic character, which has been uſed by all the great maſters of the art, will continue to be preferred, only interſperſed with a few Roman names for the ſake of variety; and that this new improvement, alike diſclaimed by taſte and knowledge, will be totally diſmiſſed.

It was alſo about the period of the death of d'Anville, that Mr. Arrowſmith began to aſſert the prerogative of an Engliſh artiſt, and inſtead of copying French maps, or employing French deſigners, to make his own drawings from original materials. The ſucceſs he has met with has correſponded with the merit of the attempt, and it would be difficult to name any of his maps which has not the praiſe of ſome originality. Sometimes free in his communications, he has the uſual return of communications from all quarters, while a narrow jealouſy only ſerves

to defeat its own purpoſes; and thus, though without the advantages of education, and ſo totally unverſed in the languages, that he cannot even write his own, he has liberally availed himſelf of the knowledge of others. More eminent as a hydrographer than as a geographer, Mr. Arrowſmith commonly lays down the ſhores with ſome accuracy, and from the moſt recent diſcoveries; and he has great merit in being the firſt who attempted to lay down the chains of mountains in large maps, on the real geographic plan, as deſcribing the nature and appearance of the earth. After this tribute of juſt applauſe, it may be hinted that a conſiderable ſhare of learning is required to delineate the interior geography of a country, and that many groſs errors of projection and even of latitude have been detected, which may in ſome inſtances proceed from want of reading, but on other occaſions, from the multifarious occupations of the author, the rapidity of his publications, and the careleſſneſs of the draftſmen employed, a great cauſe of the exactneſs of d'Anville, probably ariſing from his employing no draftſman whatever. Hence, though Mr. Arrowſmith was moſt liberally paid for the maps which accompany this work, yet ſcarcely a drawing could paſs without many corrections and improvements by the author; who, without being anſwerable for the defects, may however lay claim to the chief improvements. But while Mr. Arrowſmith is often not ſufficiently careful of his own reputation, he is always ready to liſten to any admonition, and to adopt any corrections or improvements, ſo that the late impreſſions of his maps are always to be preferred. But in this memoir, which is not intended to be a vehicle of perſonal praiſe or diſpraiſe, but merely to ſerve the progreſs of the ſcience, it may alſo be hinted that while Mr. Arrowſmith has greatly improved the appearance of the land, he neglects that of the ſea, which is only marked by a tranſitory colour, ſo as to give his maps the appearance of ſketches rather than of finiſhed productions.* It is indeed better that the ſea be neglected than the land; but in a perfect map attention to both is expected, in a manner that will ſtand the teſt of ages. His new map of the Weſt Indies, including New Spain, has his uſual merits and defects; there being many great improvements totally unknown to d'Anville, whoſe map had been generally followed, but the latitude of Mexico is unfortunately laid down at

* To a rigid diſciple of D'Anville, Mr. Arrowſmith's maps in general will appear rapid ſketches, with important diſcoveries and improvements. Such is the opinion of the beſt judges at home and abroad. One is forced to refer to them for recent diſcoveries, becauſe there are no others; by no means as good, but as the beſt of the bad. So much the author muſt ſay in his own vindication, as he has been ridiculed abroad for his praiſe of "ſuch ignorant, careleſs, and haſty publications."

19°58',

19°58′, while by repeated and exact obſervations of Galiano, it is 19°25′; and this error of thirty three miles diſturbs the geography of the circumjacent provinces. In another edition theſe defects will be remedied, and the whole improved from the deſcription here given of New Spain. At preſent his map of Scotland from the original great ſurvey of general Roy excites the public expectation.*

It is hoped that even in this rapid ſketch, few objects of conſequence have been omitted, and any ſuch omiſſion will be wholly foreign to its intention. It is not a little remarkable that while our maps were copied from thoſe of the great French geographers, we in return furniſhed books of general geography, which were tranſlated into French. Salmon's State of all Nations was tranſlated into French and Italian; and in the ſlow advancement of their literary knowledge, is to this day quoted by Spaniſh authors. Gordon, a teacher of mathematics, had applied the ſtrange name of grammar to a ſmall and dry treatiſe of geography, for the uſe of youth, not knowing that *grammar* in no language extends beyond the uſe of letters and words; and is of all ſciences, perhaps, the moſt remote from geography, which is built on drawings, maps, plans, and deſcriptions. Yet this ſtriking abſurdity was retained by Salmon and Guthrie; and the tranſlation of the work aſcribed to the latter, is a further proof, that, while the French excelled in maps, they were deficient in elementary works, though their language abounds with excellent geographical diſſertations. The diffuſeneſs and pedantry of Du Freſnoy, and the dry, though commonly accurate conciſeneſs of Nicolle Lacroix, † conſpired to avert men verſed in the other ſciences from this pleaſing and important ſtudy, which they ſeemed to regard as only adapted to education; and when a queſtion aroſe were contented to conſult ſome erroneous dictionary. Nor did the tranſlation of Guthrie, extended to nine volumes, and accompanied with a load of matter alike dry and extraneous, contribute much to remove their averſion. The object wanted was to treat geography in a more noble and elevated man-

* His other chief maps are indicated in the catalogue at the end. Since the death of La Rochette, Mr. Faden has publiſhed little remarkable. La Rochette had begun a map of South America, and it is ſaid that two French young men have been found qualified to continue his labours, as Mr. Faden does not pretend to knowledge of the languages, nor ſkill in the ſcience, which his jealouſy, as I have found and experienced, rather tends to obſtruct; and unfortunately has the uſual effect of preventing the free communications of others.

† The beſt French abſtract of geography for the uſe of youth is that of M. Nicolle de la Croix, in two thick volumes duodecimo. It was firſt publiſhed in 1752; and muſt not be confounded with the geography of a M. de la Croix, publiſhed about 1650.

For many other authors the reader may conſult the catalogue of Dufreſnoy, which will ſhew how difficult it is to write well on a ſcience where, for one author who ſurvives, a thouſand periſh.

ner, and with an arrangement truly ſcientific; and by thus raiſing it to the dignity of the other ſciences, to preſent it in a form worthy of the claſſical models of antiquity, capable of delighting and inſtructing the reader, of informing alike the ſtateſman and the man of ſcience, and of diffuſing ſolid knowledge among all ages, ranks, and conditions.

The gratitude of the author for the favourable reception of the preſent work will, it is hoped, be beſt evidenced in the ſedulous labour which he has beſtowed upon this new edition; in which the extent, plan and arrangement, of a complete ſyſtem of modern geography, ſuch as they appeared after long and mature conſideration, have at length been effected. He may venture to foreſee that, by abridging or withdrawing ſome particular parts, for example, in the accounts of Polyneſia and the Weſt Indies, and ſometimes by additional annotations, it may not be neceſſary, even for a century, to add more than one hundred pages. The dreams concerning the importance of diſcoveries to be made in the centre of Africa will fade before the light of authentic knowledge; a few ſavage tribes, a few towns built of mud, ſandy deſarts, and thorny foreſts, will not authoriſe long deſcriptions. The courſe and termination of the Niger, when known, cannot warrant in a general ſyſtem, a detail approaching to the infinitely ſuperior grandeur of the Maranon. When European nations ſhall abandon their wars, which may be called civil and inteſtine, and ſhall, by the ſubjugation of Africa, eſtabliſh induſtry and civilization in that unhappy continent, ſome centuries muſt elapſe before the deſcription, interrupted by vaſt deſarts, can correſpond to an equal extent of cultivable ſoil in South America.

Chiefly by recent Engliſh enterpriſe the globe has been at length completely explored; and there can remain no new diſcoveries of ſufficient importance, to embarraſs geographical arrangement. The Magellanic Lands have been finally diſmiſſed from geography; and of the Terra Auſtralis only a ſcientific reminiſcence remains in the appellation of Auſtralaſia. To avoid an ambiguous and long circumlocution, the name Polyneſia has been adopted for the numerous ſcattered iſlands in the Great or Pacific Ocean, which being the wideſt expanſe, is ſufficiently indicated by the former epithet. Far from making any apology for adopting theſe new diviſions, the author wiſhes that men of ſcience would at length exert their authority, (and their's is the only competent court,) to prevent the diffuſion of barbarous and abſurd appellations, which can ſcarcely even be uſed with gravity in ſolemn compoſition. Nor may it be unneceſſary to remind the unlearned reader, that theſe appellations are only new to him, having been uſed by the German writers on natural hiſtory and

and geography, for more than twenty years; ſo that without a knowledge of them it would have been impoſſible to have underſtood many valuable authors. The routine and infallible obſtinacy of ignorance have always been found long to reſiſt any improvements in the ſciences; and in this the difficulty is increaſed, becauſe illiterate compilers and venders of maps, often anxious to ſell antiquated productions, naturally withſtand any improvements that might injure their traffic. Some have even been found ſo totally unacquainted with the ſubject, as to ridicule the idea of ſix quarters of the globe, not knowing that there are eight great quarters of the compaſs! Quarters of the globe formed a familiar and vulgar expreſſion long before America was diſcovered; and every ſchool boy knows when he is in his quarters, and conſults Ainſworth's dictionary, that quarter is *regio*, a region.*

But in fact the term *quarter of the globe* begins like that of *zone*, to be antiquated; the proper term is *region* or *diviſion*; and in a complete ſurvey of the globe, as now diſcovered, there are two grand continents inſulated by the ocean, one of them being called America, while the other is arbitrarily divided into Aſia, Europe, and Africa. A third continent, for a continent, like a planet, may be large or ſmall, is Notaſia, abſurdly called New Holland, but as it approaches more to the received ideas of a large iſland, and has many great iſlands adjacent, the novelty of the appearance excites new ideas, and demands a new appellation. Notaſia therefore, with the adjacent large iſlands, may, in exact and ſcientific deſcription, be regarded, not only as a new quarter, region, or diviſion of the globe; but, with the adjacent large fragments of land, as forming in preciſe language a grand MARITIME diviſion, under the name of Auſtralaſia, being to the ſouth of that grand continent, and the only part which really exiſts of the ſuppoſed Terra Auſtralis. In like manner, as it would be a needleſs circumlocution, to ſay 'the numerous groups of iſlands lately diſcovered in the Pacific Ocean'; not to mention that even

* Among the ſignifications of quarter, indicated by Johnſon, are 'a region of the ſkies, as referred to the ſeamen's card,' in which ſenſe it is uſed by the claſſical Addiſon; and even a particular region of a town or a country. Among other ſenſes, perhaps theſe critics will be glad to demand quarter. Even in French, though the French have no right to legiſlate in maritime diſcoveries, *quartier* means any part; *la ville de Londre eſt diviſée en vingt-ſix quartiers*, 'the city of London is divided into twenty-ſix quarters or wards.' Yet a very ignorant noble emigrant has formally propoſed to the public to divide the globe into four regular quarters, like an orange; and the firſt comprising Europe and Africa is forſooth to be called *Celtica*, in honour of the ideal Celts of France, a great people unknown to hiſtory, or by any monument whatever of civilization; an idea as wiſe as that of M. Cambry, above mentioned, that I was hired to degrade the honour of France by writing againſt the Celts!

the circumlocution would be ambiguous, as it might be underſtood to include Auſtralaſia, and all the iſlands along the weſtern coaſt of America, the name of Polyneſia becomes indiſpenſable for another grand MARITIME diviſion. In this view, even the vulgar expreſſion and acceptation of four quarters might be retained for the grand TERRENE, or continental regions, to which the two MARITIME diviſions are ſupplemental.

In a general view of the globe, it muſt not be forgotten that Delambre and Mechain, charged to meaſure the arc of the meridian between Dunkirk and Barcelona, have diſcovered irregularities in the degrees, but not ſufficient to intereſt geography. The degree meaſured by Maupertuis, in Bothnia, not in Lapland, as he imagined, being rather ſuſpected; upon a freſh menſuration, by Hielm, there was found an error of one hundred and ninety-ſix toiſes, ſo that the oblateneſs of the earth towards the poles is now computed at $\frac{1}{311}$*.

Having thus diſcuſſed the progreſs of geography in the two moſt enlightened countries of the world, and thoſe which have the moſt contributed to its advancement, little remains to be added; and as the topics are brief, the arrangement becomes of little moment. As mere curioſities may be mentioned, the large Greek maps publiſhed at Vienna, of which M. Barbié du Bocage was ſo kind as to favour me with a copy. There are a planiſphere, and ſeparate maps each in four or more ſheets, of the four received diviſions of the globe, and the ſingular appearance of the modern names in Greek letters is not a little amuſing. But the map of Greece, in nine ſmall ſheets, though of little importance in exact geography, is more intereſting; and may ſerve to indicate and rectify ſome poſitions. Nor are the Greeks, who deſerve a better fate, without recent elementary works on geography. Having thus hailed the parent of European ſcience, let us paſs to Italy, where Zannoni has publiſhed at Naples in 1803, a proſpectus of a new map of Italy, in fifteen ſheets, a labour for which he is highly qualified. This geographer praiſes the map of Bacler d'Albe, which includes Italy and the ſouthern part of Germany, particularly the delineation of Corſica, the duchy of Mantua, and ſome other parts, as quite new and ſuperior to all other maps; but blames the Tuſcany of d'Albe, the Venetian States, and kingdom of Naples. Piedmont, and the coaſt of Genoa alſo preſent many miſtakes; and the city of Genoa is moved ten minutes too much to the eaſt.

From Italy the paſſage is not difficult to Spain, where unexpectedly we

* See Lacroix Introduction to this Geography, p. lxxiv, lxxv. Fr. Ed. 1804.

find a considerable progress in geography. The astronomical labours of Tofino and Malespina, upon the coasts of Spain and her colonies, are well known. Antillon, professor of geography in the Royal Seminary of nobles at Madrid, has published maps of different regions of the world, for the use of that academy, with analyses or memoirs, which often present useful and recent information; but the size of each map being only a small sheet, it is to be regretted that they cannot render more essential service. That of North America is however very valuable, from the novelty of the course of some rivers, and the positions of some large lakes in the northern part of the Spanish dominions. More important geographical documents are derived from the new missions on the east of the Andes; and the travels of the missionaries, 1790—1800, related at great length in the *Mercurio Peruano*, and repeated, with additional information, by Estalla, disclose at length the real and surprising course of those prodigious rivers, the Maranon and the Beni, which would convey a frigate to Peru or La Plata. The minuteness of the observations, and the seemingly exact indications of the latitudes and itinerary distances warranted the new delineation, now first given in the small maps which accompany this work; but it is to be regretted that the map by Sobreviela, one of the missionaries, the publication of which is promised in the *Mercurio Peruano*, has not yet reached England. It is to be hoped however that Bauza, in his new map of South America, will not only insert these grand discoveries, but rectify many errors of La Cruz. Before leaving Spain, it is proper to mention a work which ought ere now to have been translated into English, namely, the Spanish Voyage to the Western Coast of North America, 1792, published at Madrid, 1802, 4to. with a large and curious introduction concerning the history of the Spanish discoveries.

On visiting the North of Europe we shall find a new trigonometrical survey of Holland begun; and that of Denmark by Bygge nearly completed. That of Sweden by Hermelin, must now be finished. Germany rather publishes criticisms than maps:

La critique est aisée, mais l'art est difficile:

And the maps there published have few pretensions to beauty; nor, what is surprising, is there yet one map of Germany with a just delineation of the mountains. The pretensions of the little observatory at Weimar to geographical improvements are truly ridiculous, and the maps the most coarse and clumsy imaginable. Sotzmann, in Prussia, has however his merit, and has published a map of Germany, since the partition

partition of indemnities, but a new one is already wanted. Reichard has publiſhed a very uſeful guide to travellers, in three volumes, 8vo. which preſents at one view the chief objects of inſtruction and curioſity, in every European country. The excellent atlas of Swiſſerland, by Weiſs, is well known. In the ſecond edition of his general map, the northern part of the lake of Conſtance has aſſumed a new ſhape, from recent obſervations.

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INTRO

INTRODUCTION.

1. GEOGRAPHY, as it relates to the figure and dimenſions of the earth, and the relative ſituations of places upon its ſurface, is founded upon the principles of ASTRONOMY; we ſhall therefore give a full and familiar explanation of ſuch parts of the latter ſcience, as may be neceſſary for underſtanding the former; together with ſuch other matters as may be conſidered a proper introduction to the work.

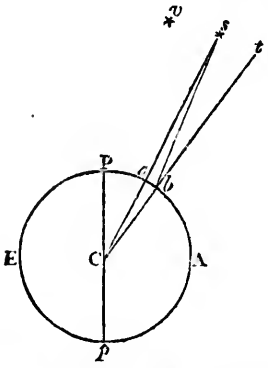
On the Figure and Dimenſions of the Earth.

2. The earth is a ſpherical body, and its figure is very nearly that of a perfect globe, not conſidering the [illegible] unevenneſſes of its ſurface ariſing from hills and [illegible] as they bear no more proportion to its magni[illegible] than the ſmalleſt grain of ſand does to a com[illegible]. The truth of this is manifeſt from the following circumſtances: 1ſt, When you ſtand upon the ſhore, the ſpherical form of the ſea is manifeſt to the eye. 2dly, When a ſhip leaves the ſhore, and goes out to ſea, you firſt loſe ſight of the hull, and then of the maſt, gradually from the bottom to the top: And when a ſhip approaches the ſhore, you firſt ſee the top of the maſt, and then the lower parts gradually appear, till at laſt you ſee the whole ſhip. Now theſe appearances would not take place, if the ſea were a plane; for then every part of the ſhip would diſappear together, after leaving the ſhore, and appear all at once when it approaches the ſhore; or rather, the hull would diſappear laſt, or appear firſt, that being the moſt conſpicuous part of the ſhip, which is contrary to matter of fact. But the appearances are exactly what they ought to be, upon ſuppoſition that the ſea is ſpherical, in which caſe the convexity of the water would produce the phænomena which are obſerved. 3dly, From the voyages of the navigators MAGELLAN, SIR FRANCIS DRAKE, LORD ANSON, COOK, and many others who have ſailed round the earth, having ſet off in one direction, and continuing their courſe, have come home in the oppoſite direction; that is, they have ſet off eaſt and come home weſt, or ſet off weſt and come home eaſt: this could not have happened if the earth had not been of a globular figure. 4thly, Another proof of the ſpherical form of the earth, ariſes from the form of the boundary of its ſhadow upon the moon in a lunar eclipſe, that boundary being always ſpherical; and nothing but a ſpherical body can, in all ſituations, produce a circular ſhadow. 5thly, If you travel towards the north, many new ſtars will appear above the horizon in the northern parts, and thoſe in the ſouthern parts near the horizon will diſappear. This can only ariſe from the ſpherical form of the earth. In ſhort, all the appearances both upon the earth and in the heavens, are juſt what they ought to be upon ſuppoſition that the earth is globular; but they will none of them anſwer to that of a plane ſurface.

3. The globular figure of the earth being thus eſtabliſhed, we proceed next to ſhow that the apparent diurnal rotation of all the heavenly bodies ariſes from the rotation of the earth about one of its diameters, called its *axis*. The apparent diurnal motion of all the heavenly bodies may ariſe from the rotation of the earth about its axis; or it may be accounted for by ſuppoſing the earth to be at reſt, and all the bodies daily to perform their revolutions about it. Now, if we ſuppoſe the earth to be at reſt, all the fixed ſtars muſt make a complete revolution every day in parallel circles. But aſtronomers have very ſatisfactorily proved, that the neareſt of the fixed ſtars is not leſs than 400,000 times further from us than the ſun is, and that the ſun's diſtance from us is not leſs than 93 millions of miles. Alſo, from the diſcoveries which are every day making by the vaſt improvement of teleſcopes, it appears that the heavens are filled with an almoſt infinite number of ſtars, whoſe diſtances are, probably, incomparably greater than what we have ſtated above. But that an almoſt infinite number of bodies, moſt of them inviſible except by the beſt teleſcopes, at almoſt infinite diſtances from us and from each other, ſhould have their motions ſo exactly adjuſted as to revolve in the ſame time, and in parallel circles, and all this without their having any central body, which (as SIR I. NEWTON has proved) is a phyſical impoſſibility, is an hypotheſis not to be admitted, when we conſider that all the phænomena may be ſolved ſimply by the rotation of the earth

earth about one of its diameters. If, therefore, we had no other evidence, we might rest satisfied that the apparent diurnal motions of all the heavenly bodies are produced by the earth's rotation. But we have other reasons for this supposition. Experiments prove that all the parts of the earth have a gravitation towards each other. Such a body, therefore, the greater part of whose surface is a fluid, must, from the equal gravitation of its parts only, form itself into a sphere. But it appears from mensuration, that the earth is not a perfect sphere but a spheroid, having its equatorial longer than its polar diameter. Now if we suppose the earth to revolve, the parts most distant from its axis must, from their greater velocity, have a greater tendency to fly off from the axis, and therefore that diameter which is perpendicular to the axis must be increased. That this must be the consequence appears from this experiment, that if you take a thin iron hoop, and make it revolve swiftly about one of its diameters, that diameter will be diminished, and the diameter which is perpendicular to it will be increased. The figure of the earth, therefore, which is that of a spheroid flattened a little at the poles, must have arisen from its rotation. Another reason for the earth's rotation, is from analogy. The planets are opaque and spherical bodies, like to our earth; now all the planets, on which sufficient observations have been made to determine the matter, are found to revolve about an axis, and the equatorial diameters of some of them are visibly greater than the polar. When these reasons, all upon different principles, are considered, they amount to a proof of the earth's rotation about its axis, which is as satisfactory to the mind as the most direct demonstration could be. These, however, are not all the proofs that might be offered; the situations and motions of the bodies in our system, necessarily require this motion of the earth. It is no objection to the earth's rotation that we do not perceive it; for we know by experience, that when we are in the cabin of a ship on smooth water, if the ship turn round we do not perceive its motion, and all the fixed bodies on the shore appear to turn in a direction contrary to that of the ship. And in like manner, the earth turning about its axis from west to east, all the heavenly bodies appear to move from east to west. It has also been objected to the earth's rotation, that, in such a case, if a ball were thrown perpendicularly upwards, it ought to fall westward of the place from which it was projected. But it is to be observed, that when you project the ball upwards, it partakes of the earth's motion, and is carried on with it all the time it is rising, so as to continue directly over the place from which it was projected. This may be exemplified by letting fall a stone from the top of the mast of a ship in motion, for the ball falls as near to the foot of the mast, as it would do if the ship were at rest. Or when you are riding in a carriage, if a ball be let fall from the top, it meets the floor at the point which is directly under that from whence it fell.

4. The magnitude of the earth comes next to be considered; and as the figure of the earth is verly nearly that of a perfect sphere, we may, for our present purpose, consider it as such. And here we must premise, that if a sphere be cut through by a plane, the section will be a *circle*: if the plane pass through the center of the sphere, the section is called a *great* circle; if it do not pass through the center, it is called a *small* circle. Also, that point of the heavens which is directly over the head of the spectator, is called his *Zenith*; and the opposite point, or that directly under his feet, is called his *Nadir*.



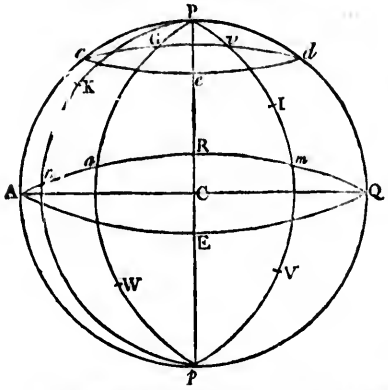
Let *PApE* represent the earth, *C* its center, *PCp* the axis about which it turns; then the extremities *P*, *p*, are called poles; one, as *P*, the *north* pole, and the other, *p*, the *south* pole; and all the great circles, as *PApE*, passing through the poles, are called *Meridians*. Now all circles are supposed to be divided into 360 equal parts, called *degrees*; every degree into 60 equal parts, called *minutes*; and every minute into 60 equal parts, called *seconds*; and degrees, minutes, and seconds, are denoted by these characters, °, ′, ″; thus 37°. 18′. 25″. means, 37 degrees, 18 minutes, 25 seconds. And the angles at the centre of the circle corresponding to the arcs, are called angles of so many degrees, minutes, and seconds. From *C* draw the right line *Cas* to a star at *s*; then the star *s* is in the zenith of a spectator at *a*; take *ab* = 1°, and draw *Cbt* to the heavens at *t*, then *t* is the zenith to a spectator at *b*; also, the angle *aCb*, or *sCt*, is 1°; join *bs*; then because the radius *Cb* of the earth bears no sensible proportion to the distance *Cs* of the fixed stars, the angle *sbt* will not sensibly differ from the angle *sCt*, or from 1°; therefore to a spectator at *b*, the star *s* will be one degree from his zenith *t*. Let an observer therefore move from *a* to *b*, till he finds, from observation, that the star *s* is 1° from his zenith, and then he knows that he has moved 1° upon the surface of the earth. Let the distance *ab* be measured, and then you get the length of an arc of 1°; and if you multiply that by 360, the product

duct will give you the circumference of the earth. An arc *ab* of any number of degrees may be taken, and then its length being measured, the length of 1 degree may be found by proportion. Or, instead of supposing the star to have been in the zenith of the spectator at *a*, we might have taken a star at *v*, and the difference between the zenith distances of the star *v* at the places *a* and *b*, would have been the same as that of the star *s*; so that when the observer had moved over an arc *ab* of 1°, the zenith distance of the star *v* would have altered 1°. In this manner the length of a degree of a great circle upon the earth's surface has been determined, and thence, its circumference. POSSIDONIUS, who lived in the time of POMPEY the *great*, attempted thus to measure the circumference of the earth; he knew that the star called *Canopus* was in the horizon at *Rhodes*, and that at *Alexandria* its altitude on the meridian was $7\frac{1}{2}$°; and the distance between the two places (they being nearly the same meridian) was 5000 *stadia*; whence he concluded the circumference of the earth to be 240,000 *stadia*. But as the exact value of the *stadia* is not now known, we cannot say how accurate this conclusion is. Our countryman MR. NORWOOD, in the year 1635, was the first who determined the value of a degree to a considerable accuracy. He took the height of the pole star at *London* and at *York*; and by measuring their distance, he determined the length of a degree to be $69\frac{1}{2}$ miles and 14 poles. After that time, the French academy measured a degree. *Cassini* measured one in *France*; and afterwards *Clairaut*, *Maupertuis*, and several other eminent mathematicians, measured a degree in *Lapland*. The same measurements have been also frequently repeated in various parts of the earth, and the result of the whole is this, that the length of a degree, as you go from the equator to the poles, increases in length. Now the longer a degree is, the greater must be the circle of which it is a part; and the greater the circle is, the less is its curvature. It appears therefore from actual mensuration, that the earth is flatter, or of less curvature, at the poles, than at the equator, agreeable to what we before showed must necessarily be the consequence of the earth's rotation. The length of a degree in latitude 45° is 69,2 English miles, and this we may consider as a *mean* length; hence, $69,2 \times 360 = 24912$ miles, the circumference of the earth; and as the circumference of every circle is to its radius as 6,28318 to 1, we have, 6,28318 : 1 :: 24912 : 3965 miles, the radius of the earth. DR. LONG estimated the proportion of land to water upon the surface of the earth, so far as discoveries had then been made, in the following manner. He took the paper off a terrestrial globe, and then cut out the land from the sea, and weighed the two parts; by this means he found the proportion of the land to the sea as 124 : 349. The conclusion would be more accurate, if the land were cut from the sea *before* the paper was put upon the globe. After all the modern discoveries, this method would probably give the proportion of land to water, to a considerable degree accuracy.

5. We have already observed, that the earth is not a perfect sphere but a spheroid, having the polar diameter shorter than the equatorial; and the ratio of these diameters has been determined by different methods. If the length of a degree at two places be found by mensuration, that *datum* is sufficient to find the ratio; but the ratios thus determined, by taking different measurements, differ considerably. MR. VINCE, in his *Complete System of Astronomy*, vol. ii. page 99, has determined the ratio from a great many comparisons; and it will be found that they differ considerably; but the *mean* of the whole gives the ratio of 177 : 178 for the proportion of the polar to the equatorial diameter of the earth. SIR I. NEWTON, from the principles of gravitation, makes the ratio 229 : 230; and some authors have deduced a mean ratio from mensuration, which agrees very nearly with this. The length of a pendulum vibrating seconds, increases as you carry it towards the poles; and this ought to take place in consequence of the spheroidical figure of the earth, as before determined, and affords another proof of that figure. And if the length of a pendulum vibrating seconds in two latitudes could be accurately ascertained, we might find the ratio of the diameters of the earth, the density of the earth being supposed uniform. But the ratios thus deduced from different observations, differ considerably; owing, probably, to the irregularity of the density of the interior parts of the earth. M. CLAIRAUT observes, that the variations of the lengths of pendulums make the ratio of the diameters nearer that of equality than 229 : 230, indicating a greater density towards the center. It has been also proposed to find the ratio of the diameters of the earth, from solar eclipses, as the computation of the parallax of the moon, and consequently the times of the beginning and end of such eclipses, will vary, according as the ratio of the diameters of the earth vary. M. de la LANDE from hence makes the difference of the diameters to be $\frac{1}{300}$ of the whole. From a consideration of all the circumstances, it is probable that the difference of the polar and equatorial diameters is less than that which is determined by SIR I. NEWTON. If we take the ratio of the diameters as determined by him, the equatorial diameter will be found to exceed the polar, by about 34 miles.

6. It appears by calculation, that when the eye of a spectator is 6 feet above the surface of the sea, he can see 3 miles; and at any other altitude of the eye, the distance at which you can see, varies as the square root of the altitude; if therefore *a* be the altitude of the eye in feet, and *d* the distance in miles, which you can see at that altitude, then $\sqrt{6} : \sqrt{a} :: 3 : d = \frac{3}{\sqrt{6}} \times \sqrt{a} = 1,2247 \times \sqrt{a}$; hence, we have this rule: *Multiply the square root of the height of the eye in feet, by 1,2247, and the product is the distance to which you can see in miles.* For example; if the height of the eye be 25 feet, then the square root of 25 is 5, and if you multiply 1,2247 by 5, the product is 6,1235 miles, the distance to which the eye can see.

On the Latitude and Longitude of Places upon the Earth's Surface.



7. Let *PApQ* represent the earth, *PCp* its axis, *P* the north pole, *p* the south pole; and let *AEQR* be a circle passing through the center *C*, perpendicular to the axis *Pp*, then that circle is called the *equator*. This circle divides the earth into two equal parts, *APQ* called the *northern*, and *ApQ* called the *southern hemisphere*. Let *K*, *G*, *I*, be the situations of three places upon the surface, and through them draw the great circles *PKp*, *PGp*, *PIp*, called *meridians*, intersecting the equator in *n*, *a*, *m*, respectively. Now as every circle is supposed to be divided into 360 degrees, from he pole to the equator must be 90 degrees. The *latitude* of a place, is *an arc of its meridian intercepted between the place and the equator, measured in degrees*. Hence, the latitude of *K* is measured by the degrees of the arc *nK*; and the latitudes of *G* and *I* are measured by the degrees of the arcs aG, mI, respectively, and these are called *north* latitudes, the places lying in the northern hemisphere; and the latitude of *W* is measured by the degrees of the arc *a W*, and is called *south* latitude, the place lying in the southern hemisphere. Let the small circle *cGvde* be parallel to the equator, then this circle is called a *parallel of latitude*, because every point of it has the same latitude, all the arcs *mv*, *aG*, intercepted between it and the equator, being equal, on account of the circles being parallel. The *longitude* of a place is measured upon the equator, and is the arc intercepted between the point from which you begin to reckon, and the point where the meridian of the place cuts the equator, estimated in degrees. Hence, all places in the *same* meridian have the *same* longitude; the longitude of *G* is the same as the longitude of *W*. Geographers of different countries begin to reckon from different points, each beginning from that point where the meridian of its capital city cuts the equator; and if the city have a national observatory in or very near to it, that meridian is taken which passes through the observatory. This is called the *first* meridian. We may therefore define the *longitude* of a place to be *an arc of the equator intercepted between the first meridian and the meridian passing through the place*. In *England* therefore we begin from that meridian which passes through the observatory at *Greenwich*; in *France*, they begin from that meridian which passes through the observatory at *Paris*. Let therefore *G* represent the royal observatory at *Greenwich*, and *a* is the point of the equator from which we begin to reckon the longitude. Hence, the degrees of the arc *am* is the longitude of the place *I*; and the longitude of the place *K* is measured by the degrees of the arc *an*. Now the direction *am* from *a* is east, and the direction *an* is west; it is therefore usual to call *am east* longitude, and *an west* longitude, each till you come to the point opposite to *a*, or till the longitude each way becomes 180 degrees. But sometimes the longitude is reckoned all the way round in the same direction; that is, the point *m*, wherever it may be, is called east longitude from *a*.

8. If the latitude and longitude of a place be given, the place itself may be found; for if the longitude be known, set off the arc *am* equal to it, if it be east longitude, and draw the meridian *Pmp*; then if the latitude be north, set off *mI* equal to it, and *I* is the place required; but if the latitude be south, set off *mV* equal to it, and V is the place. If the longitude be west, set off *an* equal to it, and take *aG*, or *aW* equal to the latitude, according as it is north or south, and *G*, or *W*, will be the place. Thus, all the places upon the surface of the earth, whose latitudes and longitudes are known, may be laid down accurately upon a globe; and the boundaries of the different countries may be traced out, and each exhibited in its proper situation and figure. By means of a globe therefore you may get a perfect idea of the relative magnitudes, figures, and situations of all the countries of the earth, and of the situations of all the principal places in them; but a map, being a plane surface, cannot correctly represent their proportions, boundaries, and positions of the places. The determination of the latitude and longitude is therefore essential to geography, and consequently to navigation; the methods by which these are found, we shall afterwards fully explain.

9. The arc *Gv* contains the same number of degrees as the arc *am*; the degrees of longitude therefore between any two places, when measured upon a small circle parallel to the equator, diminish as that circle approaches the pole. The arc *am* contains the same number of degrees as the angle *aPm*; hence, the angle formed by the meridians passing through any two places, is the measure of the difference of the longitudes of those places.

10. The following Table contains the length of a degree of longitude in English *miles* for every degree of latitude.

Lat.

Lat.	Deg. of Long.	Lat.	Deg. of Long.	Lat.	Deg. of Long.	Lat.	Deg. of Long.	Lat.	Deg. of Long.
0°	69,2000	18°	65,8134	36°	55,9842	54°	40,6751	72°	21,3842
1	69,1896	19	65,4300	37	55,2659	55	39,6917	73	20,2320
2	69,1578	20	65,0265	38	54,5303	56	38,6959	74	19,0743
3	69,1052	21	64,6037	39	53,7788	57	37,6891	75	17,9103
4	69,0312	22	64,1609	40	53,0100	58	36,6705	76	16,7409
5	68,9363	23	63,6986	41	52,2259	59	35,6408	77	15,5665
6	68,8208	24	63,2177	42	51,4253	60	34,6000	78	14,3874
7	68,6845	25	62,7167	43	50,6094	61	33,5489	79	13,2041
8	68,5267	26	62,1963	44	49,7783	62	32,4873	80	12,0166
9	68,3481	27	61,6579	45	48,9313	63	31,4161	81	10,8250
10	68,1489	28	61,1001	46	48,0705	64	30,3352	81	9,6306
11	67,9288	29	60,5237	47	47,1944	65	29,2453	83	8,4334
12	67,6880	30	59,9293	48	46,3038	66	28,1464	84	7,2335
13	67,4264	31	59,3162	49	45,3994	67	27,0385	85	6,0315
14	67,1448	32	58,6851	50	44,4811	68	25,9230	86	4,8274
15	66,8424	33	58,0360	51	43,5489	69	24,7992	87	3,6219
16	66,5192	34	57,3696	52	42,6037	70	23,6678	88	2,4151
17	66,1760	35	56,6852	53	41,6453	71	22,5294	89	1,2075

On the Atmosphere of the Earth.

11. The earth is surrounded with a thin, invisible, elastic fluid, called *air*, the whole body of which forms what is called the *atmosphere*. It being an elastic fluid, is capable of compression; on which account, the lower parts of the atmosphere are denser than the upper parts, and the density gradually diminishes, the higher you go, from the continual diminution of compression; for the air being found to have weight, as you ascend, the weight of the incumbent air will be diminished. The density of the air is not always the same, it being subject to be expanded by heat and contracted by cold. In its mean state it is found to be about 850 times lighter than water. But notwithstanding the air is so extremely rare, it is capable of producing very considerable effects upon the rays of light as they pass through it, both by reflection and refraction. By reflection, the rays coming from the sun falling on the particles of air, and upon the vapours and exhalations contained in the atmosphere, are thrown in all directions, and thus the whole heavens become illuminated; by which our eyes are affected so strongly, as to render the fainter light of the stars insensible. Whereas, if there were no atmosphere, we should receive only those rays which come directly to us, and the other parts of the heavens would appear dark, and the stars would all be visible as at night. From the same cause we receive a considerable quantity of light for some time before the sun rises, and after he sets; this is called *twilight*; and were it not for this, we should be involved in total darkness, the instant after the sun is set; and there would be a sudden transition from darkness to light, at the rising of the sun, which would be extremely prejudicial to the eyes. From the time at which twilight begins and ends, the beginning and end are found to be when the sun is about 18° below the horizon. It lasts however till the sun is further below the horizon in the evening, than he is in the morning when it begins; it also lasts longer in summer than in winter. In the *former* case, the heat of the day has raised the vapours and exhalations; and in the *latter*, they will be more elevated from the heat of the season; and therefore the twilight ought to be longer in the evening than in the morning; and longer in winter than in summer.

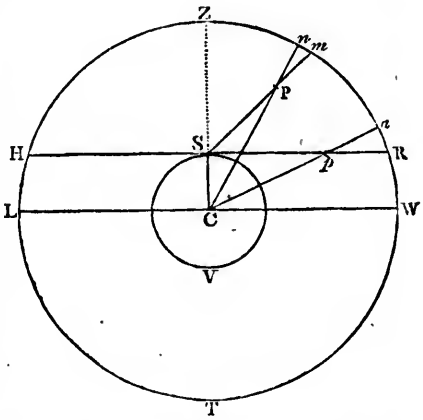
12. Another property of the atmosphere is that of refracting the rays of light, by which means the heavenly bodies appear out of their true places. It is a principle of opticks, that when a ray of light passes out of a denser into a rarer medium, it is bent *towards* the perpendicular to the surface of the medium at the point where it enters. A ray of light therefore coming from any of the heavenly bodies, when it enters the top of the atmosphere will be bent from its rectilinear course, towards a radius drawn to the earth's center, because the radius is perpendicular to the surface of the atmosphere; and as, in approaching the earth's surface, the density of the atmosphere continually increases, the rays of light, as they descend, are constantly entering a denser medium, and therefore the course of the ray will continually deviate from a right line towards a radius drawn to the earth's center, and describe a curve; hence, at the surface of the earth the rays of light enter the eye of the spectator in a different direction from what they would have entered, if there had been no atmosphere; therefore the *apparent* place of the body from which the light comes must be different from the *true* place; and as the course of the ray has been continually approaching to a radius drawn to the center of the earth, its direction, when it comes to the surface of the earth, must be inclined from its original direction, towards the zenith; therefore the *apparent* place of the body is *higher* than its *true* place. The ancients were not unacquainted with this effect: *Ptolemy* mentions a difference

difference in the rising and setting of the stars in different states of the atmosphere; but he made no allowance for it in his computations. ALHAZEN, an Arabian optician, in the 11th century, observed the effect upon the circumpolar stars; but TYCHO was the first person who constructed a table for the refractions at different altitudes, for the refraction decreases from the horizon to the zenith, where it is nothing. In the mean state of our air, the refraction in the horizon is 33′.

13. Another property of the refraction of the air is this, that it causes all the heavenly bodies to appear in the morning above the horizon, when they are actually below it; and in the evening they appear above, a little after they are actually set; for the diameter of the sun being about 32′, the refraction in the horizon elevating it 33′, will cause it to appear above the horizon when the whole body is below. In climates nearer the equator, the refraction is less than it is here; and in colder regions it is much greater, and this is a happy provision for lengthening the appearance of the light at those parts. GASSENDUS relates, that some *Hollanders* who wintered in *Nova Zembla*, in latitude 75°, were agreeably surprised with a sight of the sun 17 days before they expected him. To the same cause we must attribute another phænomenon, mentioned by PLINY, that the moon had been visibly eclipsed when she was in the west, at the same time that the sun appeared above the horizon in the east. MÆSTLINUS, in KEPLER, relates another instance of the same kind which fell under his own observation. Also, the decrease of refraction as the altitude above the horizon increases, makes the sun and moon appear of an oval form, more particularly in the horizon. For suppose the diameter of the sun to be 32′, and the lower limb to touch the horizon, then the mean refraction of that limb is 33′; but the altitude of the upper limb being then 32′, its refraction is only 28′ 6″, differing 4′ 54″ from the refraction of the lower limb; by this quantity therefore the vertical diameter is shortened, the lower limb being so much more elevated than the upper. The like is true at any other altitude, only in a smaller degree.

ON PARALLAX.

14. When you refer an object to something behind it, it will not appear in the same situation to two spectators situated at different places, unless the object be at an almost indefinitely great distance when compared with the distance of the two spectators; and the distance of these apparent places is called the *parallax* of that object. From the immense distance of the fixed stars therefore in respect to the diameter of the earth's orbit, they never appear to change their relative situations; on which account we may consider them as a back-ground to which we may refer all the bodies in our system; and we may consider them as placed in the concave surface of a sphere, of which the earth is the center. If therefore a planet, when it is in the same part of its orbit, be viewed from the two extremities of a diameter of the earth's orbit, it will appear in two different places amongst the fixed stars; and the distance between these two places is called the *annual* parallax. In like manner, if a planet, or any of the bodies in our system, were observed from the earth's center and surface, they would be referred to different places amongst the fixed stars, and the distance of those places is called the *diurnal* parallax; and this is what we have now occasion to consider.



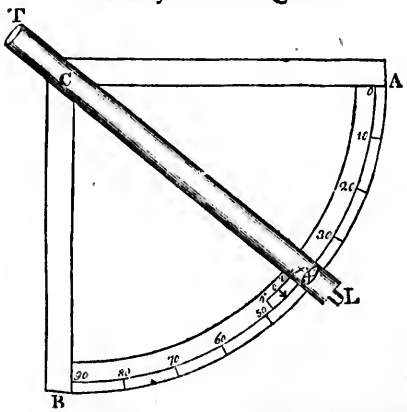
Let C be the center of the earth SV, S the place of a spectator, Z his zenith; and conceive the circle ZT to represent the sphere of the fixed stars, and let HSR be a plane touching the earth at S, then that plane is called the *sensible horizon*; it dividing the visible part HZR of the heavens from the invisible part HTR. If a plane LCW be drawn through the center of the earth, parallel to HZR, it is called the *rational* horizon. Now the arc RW amongst the fixed stars subtends no sensible angle at the earth, and hence we may suppose the two horizons there to coincide. Let P be a planet; and draw CPn, SPm; then the planet seen from S appears at m, and from C it would appear at n, and nm is called the *diurnal* parallax; because at different parts of the day, when the planet is at different altitudes, the arc mn will be different. If the planet be in the horizon at p, and we draw Cpa, then Ra is the horizontal parallax, which is the greatest of all; and from the horizon to the zenith it gradually decreases, and is nothing in the zenith. Also, the nearer a planet is to the earth, the greater is its parallax; for the nearer P is to C, the greater is the angle CPS, or nPm, which is the parallax, as that angle is measured by the arc mn. Now astronomers refer all their observations to the center of the earth, and consider the place as seen from thence, to be the *true* place; therefore the *apparent* place m seen

from the ſurface is *below* the *true* place *n*. Hence after an altitude is taken upon the ſurface of the earth, we muſt *add* the parallax correſponding to that altitude, in order to obtain the *true* altitude, or the altitude ſeen from the center of the earth, above the rational horizon. If we know the parallax of a body, we know its diſtance; for ſuppoſe we know the horizontal parallax *SpC*, then by plane trigonometry, ſin. *SpC* : radius : : *SC* : *Cp*; thus we get the diſtance *Cp* in terms of the radius of the earth.

15. It follows therefore from what we have obſerved, (art. 12. 14.) that after the altitude of an heavenly body is found by obſervation, it will want two corrections, one for refraction, and the other for parallax; the former to be ſubtracted, and the latter to be added. Thus you reduce the *obſerved* to the *true* altitude. As the fixed ſtars have no parallax, the only correction there neceſſary is that for refraction.

16. As the altitudes of the heavenly bodies are determined by an inſtrument called a *quadrant*, it may be here proper to give a general deſcription of it.

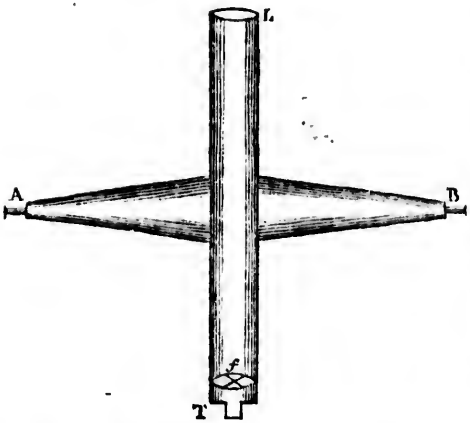
On the Aſtronomical Quadrant.



17. Let *C* repreſent the center of the quadrant, *CA*, *CB* two radii perpendicular to each other, thereby including an arc *AB* of 90 degrees; TL is a Teleſcope moveable about the center *C*; in the principal focus *f* of the object glaſs, there are fixed two fine wires at right angles to each other, interſecting each other in the center of the teleſcope; one of theſe wires is adjuſted parallel to the horizon, and conſequently the other will be perpendicular to it; the line joining the interſection of theſe wires, and the center of the object glaſs, is called the *axis* of the teleſcope, and ſometimes the *line of collimation*. The teleſcope moves againſt the limb of the quadrant, and carries with it a ſmall graduated piece of braſs rv, called a *vernier*, having a mark at *o* pointing to the diviſions of the limb. This point *o* is ſo adjuſted, that when it is ſet to point to *o* on the limb, the axis of the teleſcope is horizontal, and therefore an object in the horizon will appear upon the horizontal wire. When therefore the teleſcope is put into any other ſituation, and an object brought upon the horizontal wire, the point *o* of the vernier will be directed to a point of the limb which ſhows how many degrees high the object is above the horizon. The limb is generally divided into degrees, and each degree into three equal parts, by which the whole limb is divided into every 20 minutes. The vernier has alſo a certain number of diviſions upon it, ſo that by obſerving which two diviſions of the vernier and limb coincide, you can tell to what minute of the limb the mark *o* of the vernier is directed, and therefore know the altitude of the object above the horizon, in degrees and minutes. If no two diviſions ſhould coincide, there is another apparatus prefixed to the teleſcope at the limb of the quadrant, by which you can tell to a ſecond, the point of the limb againſt which *o* on the vernier ſtands: and thus you can aſcertain the altitude of an object to a ſecond. For a full explanation of theſe matters, we refer the reader to Mr. VINCE's *Treatiſe on Practical Aſtronomy*. This inſtrument is ſometimes fixed to a perpendicular axis, and can be placed in any ſituation, ſo that the altitude of any of the heavenly bodies can be determined by it. Sometimes it is fixed againſt a very firm ſtone wall, having its plane exactly in the meridian, ſo that only meridian altitudes can be taken by it. This is called a *mural* quadrant; and all very large quadrants are thus fixed up; for the muſt accurate obſervations which aſtronomers want, are thoſe upon the meridian, by which (as will be afterwards ſhown) the *declinations* of the heavenly bodies may be found. After an altitude is taken, it muſt (art. 15) be corrected by ſubtracting the refraction and adding the parallax, by which we get the true altitude of the object above the rational horizon correſponding to the place of the obſerver.

On

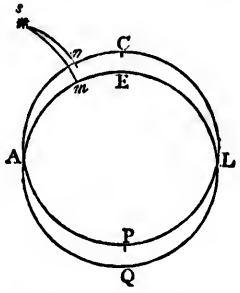
On the Transit Telescope.



18. A transit Telescope is a telescope moveable about an horizontal axis, and so adjusted, that its axis may move exactly in the plane of the meridian. The annexed figure represents this instrument; TL represents the telescope, AB the axis about which it turns, each end of which is made cylindrical; these ends are each laid in an angular notch cut in a piece of brass; and each of these pieces of brass are moveable in a brass frame fixed in firm stone pillars; each piece is moved by a screw; that at one end acts against the under side of one of the brass pieces, and gives that end of the axis AB of the telescope, a motion *perpendicular* to the horizon; and the other screw acts against one of the sides of the other brass piece, and gives the axis AB a motion *parallel* to the horizon; by means of these two screws therefore the telescope can be brought into any position. In the focus *f* of the object glass there are fixed two fine wires perpendicular to each other, and the line joining their intersection and the center of the object glass, is called the *axis* of the tube TL, or the *line of collimation* of the telescope. One of these wires is adjusted perpendicularly to the horizon, and of course the other will then be parallel to it. After all the adjustments of this instrument are made, if the instrument be turned about the axis AB, the perpendicular wire moves exactly in the plane of the meridian; so that when any object comes to this wire, by means of a clock properly regulated, you get the time of its passage over the meridian. Sometimes there are fixed one or two more perpendicular wires, equidistant from this middle perpendicular wire. For an explanation of the methods of making these adjustments, we must refer to the work before-mentioned. This instrument is used to find the *right ascensions* of the heavenly bodies, as we shall afterwards explain.

Explanation of Terms.

19. Having mentioned the *declination* and *right ascension* of the heavenly bodies, we will, before we proceed, explain these and some other terms, which we shall have occasion to make use of. We have already explained the *equator* of the *earth*; and if the plane of this circle be extended as far as the fixed stars, it will there mark out a circle which is called the *celestial* equator; and if the axis of the earth be extended to the heavens, the two points marked out by it are called the *poles* of the *celestial* equator. Thus the heavens are divided into *northern* and *southern* hemispheres, corresponding to those on the earth. Now in the course of a year, the sun appears to describe a great circle in the sphere of the fixed stars, called the *ecliptic*; this apparent motion of the sun arises from the real motion of the earth about the sun in the space of a year; it is therefore, in fact, the earth that describes the ecliptic. The equator and the ecliptic do not coincide, but are inclined to each other at an angle of about 23°. 28′, cutting each other at two opposite points, called the *equinoxes*; and this angle is called the *obliquity of the ecliptic*.



Let *AELQ* represent the celestial equator, *ACLP* the ecliptic, inclined to, and cutting each other in opposite points *A*, *L*, for all great circles divide each other into two equal parts. The ecliptic is divided into 12 equal parts, called *signs*; *aries* ♈, *taurus* ♉, *gemini* ♊, *cancer* ♋, *leo* ♌, *virgo* ♍, *libra* ♎, *scorpio* ♏, *sagittarius* ♐, *capricornus* ♑, *aquarius* ♒, *pisces* ♓. The order of these is according to the apparent motion of the sun. The first point of aries coincides with one of the equinoxes, as A, and consequently the first point of libra coincides with the other equinox L. The first six signs are called *northern*, lying on the *north* side of the equator; and the last six are called *southern*, lying on the *south* side. When the motion of the heavenly bodies is according to the order of the signs, it is called *direct*, and when the motion is in a contrary direction, it is called *retrograde*. The *real* motion of all the planets is according to the order of the signs, but their *apparent* motion is sometimes in a contrary direction, for reasons which

which will afterwards appear. The equinoctial points A, L, are not fixed, but have a retrograde motion of about 50″ in a year; this is called the *precession of the equinoxes*. The *zodiac* is a space extending 8° on each side of the ecliptic, within which the motions of all the planets are performed.

20. If *s* be the place of a star, and *sm* be a great circle perpendicular to the equator, then *Am* is called the *right ascension* of the star, and *sm* is called its *declination*.

If *sn* be a great circle perpendicular to the ecliptic, then *An* is called the *longitude* of the star, and *sn* is called its *latitude*. If therefore we know the right ascension *Am*, and declination *ms* of an heavenly body, we know its place *s*; or if we know its longitude *An*, and latitude *ns*, its place is known. If half the ecliptic *ACP* be bisected in *C*, and the other half in *P*, then *C* and *P* are the beginnings of cancer and capricorn, and these are called *tropical* points. Two small circles drawn through these two points, parallel to the equator, are called *tropics*; that passing through *C* is called the tropic of cancer, and that through *P*, the tropic of capricorn.

21. A body is in *conjunction* with the sun, when it has the same longitude; and in *opposition*, when the difference of their longitudes is 180°.

22. The *elongation* of a body is its angular distance from the sun, when seen from the earth.

23. The *antipodes* to a spectator upon the earth's surface, is that point upon the surface which is diametrically opposite to him.

24. If a body in the heavens be referred to the horizon by a vertical circle, by drawing a vertical circle through it, the distance of that point of the horizon from the north or south points, is called its *azimuth*; and the distance from the east or west points, is called its *amplitude*. These four points are called the *cardinal* points.

25. The *primary* planets are those which revolve about the sun; and the *secondary* planets are those which revolve about the primary, and these are also called *satellites*, or *moons*.

26. The *nodes* are the points where the orbits of the primary planets cut the ecliptic; and where the orbits of the secondary planets cut the orbits of their primaries. That node is called *ascending*, where the planet passes from the south to the north side of the ecliptic, and is marked thus, ☊; the other node is called *descending*, and is marked thus, ☋.

27. The *aphelion* is that point in the orbit of a planet which is furthest from the sun; and the *perihelion* is that point which is nearest to the sun.

28. The *apogee* is that point of the earth's orbit which is furthest from the sun, or that point of the moon's orbit which is furthest from the earth; and the *perigee* is that point of each orbit which is nearest to the sun, or earth.

29. The *apsis* of an orbit is either its apogee or perigee, aphelion or perihelion.

30. A *sidereal* day is the interval between two successive passages of the same fixed star, over the meridian. These days are all equal.

31. A *solar* day is the interval between two successive passages of the sun over the meridian. These days are unequal, on account of the unequal motion of the sun in right ascension. If therefore we compare a clock with the sun, and adjust it to go 24 hours from the time the sun leaves the meridian on any day, till it returns to it the next day, the clock will not continue to agree with the sun, that is, it will not continue to show 12 when the sun comes to the meridian; as will afterwards more fully appear.

32. *Apparent* noon is the time when the sun comes to the meridian; *true*, or *mean* noon is 12 o'clock, by a watch adjusted to go 24 hours in a *mean* solar day. And the difference between *apparent* and *mean* noon is the *equation of time*.

33. A star is said to rise or set *cosmically*, when it rises and sets at sun rising; and when it rises or sets at sun setting, it is said to rise or set *achronically*.

34. A star is said to rise *heliacally*, when, after having been so near to the sun as not to be visible, it emerges out of the sun's rays, and just appears in the morning; and it is said to set *heliacally*, when the sun approaches so near to it, that it is about to immerge into the sun's rays, and to become invisible in the evening.

35. A *digit* is a twelfth part of the diameter of the sun or moon.

36. A *constellation* is a collection of stars contained within some assumed figure, as a *ram*, a *dragon*, an *Hercules*, &c. The whole heavens is thus divided into constellations.

37. If an eye be in the plane of a circle, that circle appears a straight line; therefore in the representation of the circles of a sphere upon a plane surface, those circles, whose planes pass through the eye, are represented by straight lines.

38. Characters used for the sun, moon, and planets.

☉ the Sun	♂ Mars
☽ the Moon	♃ Jupiter
☿ Mercury	♄ Saturn
♀ Venus	♅ Georgian.
⊖ the Earth	

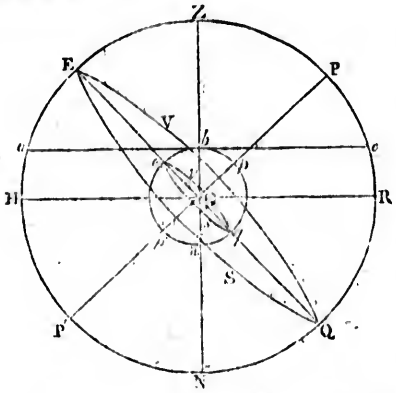
Characters used for the days of the week.

☉ Sunday	♃ Thursday
☽ Monday	♀ Friday
♂ Tuesday	♄ Saturday.
☿ Wednesday	

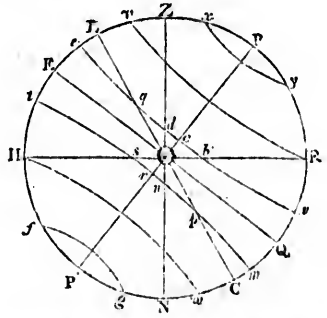
On the Doctrine of the Sphere.

39. A spectator upon the surface of the earth, conceives himself to be placed in the centre of a concave sphere, in which all the heavenly bodies are situated; and by constantly observing them, he perceives that far the greater number of them never change their relative situations, each rising and setting at the same interval of

of time, and at the same points of the horizon, and are therefore called *fixed* stars; but he finds that a few others, called *planets*, together with the *sun* and *moon*, are constantly changing their situations, each continually rising and setting at different points of the horizon, and at different intervals of time. Now the determination of the times of the rising and setting of the heavenly bodies; the finding of their position at any given time, or the time from their position; the causes of the different length of days and nights; the changes of seasons; and the like, constitute what is called the *doctrine of the sphere*.



40. Let *pep'q* represent the earth, *b* the place of the spectator, *HZRN* the sphere of the fixed stars; and although the fixed stars do not lie in the concave surface of a sphere, of which the center of the earth is the center, yet on account of the immense distance, even of the nearest of them, their relative situations are not at all affected by the motion of the earth, and therefore the place of a body in our system may be referred to them, in the same manner as if they were placed as is here supposed. Now the circle *pbep'q* is the meridian of the spectator at *b*, and let this circle be extended to the heavens and there mark out the circle *PZEP'Q*, and it will be the celestial meridian of the place; whenever therefore a body in the heavens comes to this circle, it is in the meridian of the spectator *b*; and this circle divides the heavens into two hemispheres, the *eastern* and the *western*. Let *abo* be a plane touching the earth at the place *b* of the spectator, then this plane will be his *sensible* horizon, because it divides the visible part *aZo* of the heavens, from the invisible part *aNo*; and if a plane HR be drawn through the center of the earth, parallel to *abo*, it is called the *rational* horizon; and as the arc *Ro* subtends no sensible angle at the earth, these planes, in respect to the sphere of the fixed stars, may be considered as coinciding. Now as the earth revolves daily about its axis, the heavenly bodies must successively rise and set in that time, and appear to describe circles which are perpendicular to the earth's axis, and consequently parallel to each other. Let *pp'* be the axis of the earth, *p* the north pole, *p'* the south pole; and let *evqs* be the equator; then if the plane of the equator be extended up to the heavens, it will there mark out a circle *EVQS* called the *celestial* equator; and if *pp'* be produced to the heavens to *P*, *P'*, these points are called the poles of the celestial equator; and the star nearest to these is called the *pole* star. Now, although the earth in its orbit continually changes its place, yet as the axis always continues parallel to itself *, the points *P*, *P'*, will not, from the immense distance of the fixed stars, be sensibly altered. Let *n* be the antipodes to *b*, then if the diameter *bn* be produced to *Z* and *N*, *Z* is the zenith of the spectator, and *N* the nadir. Thus we may conceive the great circles, and any places upon the earth's surface, to be transferred to the heavens. Now the latitude of the place *b* upon the earth's surface is measured by the degrees of the arc *be*; but the arc *ZE* contains the same number of degrees as the arc *be*, therefore the arc *ZE* in the heavens measures the latitude of *b* the spectator; and the degrees of the arc *bp*, which measures the distance of the spectator from the pole, contains the same number of degrees as the arc *ZP*. Hence, as the equator, zenith, poles, and horizon in the heavens, may be considered as corresponding to the equator, place of the spectator, poles, and horizon of the earth, and the angular distances of the former are respectively equal to those of the latter, we may, for our present purpose, leave out the consideration of the earth, and only consider the equator, zenith, poles, and horizon of the heavens.



41. Let therefore *PZEHP'NQR* represent the celestial meridian to the place of a spectator upon the

* This is not accurately true; the earth's axis varying a little from its parallelism from the attraction of the moon. This is called the *nutation* of the earth's axis, and was discovered by Dr. Bradley.

earth

earth whose zenith is Z, the spectator being supposed in *north* latitude; and let the figure represent either the eastern or western hemisphere of the heavens; we must therefore conceive this figure to represent half a globe, and all the lines upon it to represent circles; and as, if we conceive the eye to be vertical to the middle point O of the figure, all the circles which pass through that point will appear right lines; therefore the right lines ZON, POP', EOQ, HOR, must be considered as semicircles, HOR representing the horizon, EOQ the equator, ZON a vertical circle passing through, the zenith and nadir, perpendicular to the horizon, and this is called the *prime vertical*, cutting the horizon in O the east or west point of the horizon, according as the figure represents the eastern or western hemisphere. For the spectator being supposed to be at Z, and looking along the meridian $ZP'R$ towards the north pole P, R must be the north point of the horizon, and consequently the opposite point H will be the south point; and as the point O bisects the points H, R, it must represent the east or west point. All these circles are great circles, their planes passing through the center of the sphere. Draw the small circles wH, mt, ae, Rv parallel to the equator. Now the semicircle POP' bisects the semicircle EOQ in O, and therefore it bisects the semicircles ae, mt, in c and r. Now the ecliptic, or that circle which the sun appears to describe in a year, cuts the equator at an angle of 23°. 28′; let therefore the circle COL cut the circle EOQ in that angle, and COL will represent the ecliptic.

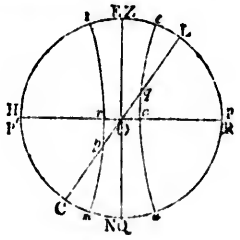
42. Now as all the heavenly bodies, in their apparent diurnal motion, describe either the equator, or small circles parallel to the equator, according as the body is in or out of the equator, if we conceive the figure to represent the eastern hemisphere, QE, ae, mt, may represent their apparent paths as they move from the meridian under the horizon till they come to the meridian above the horizon, and the points O, b, s, are the points of the horizon where they rise. Now ae, QE, mt, are bisected in c, O, r; therefore eb, the part above the horizon is greater than ab the part below; EO the part above is equal to OQ the part below; and ts the part above is less than sm the part below; and as Z represents the place of the spectator, it follows, that those heavenly bodies which are on the *same* side of the equator as the spectator, will be *longer* above the horizon than below; those bodies which are *in* the equator, are *as long* above the horizon as below; and those bodies which are on the *opposite* side of the equator to that of the spectator, will be a *shorter* time above the horizon than below. Also, the bodies describing ae, QE, mt, rise at b, O, s; that is, a body which is on the *same* side of the equator with the spectator, rises at b, from the east point O towards the north point R of the horizon; a body which is *in* the equator, rises at O in the east; and those bodies which are on the *opposite* side of the equator to the spectator, rise at s, from the east point O towards the south point H. When the bodies come to O, d, or n, they are in the prime vertical, or in the east; hence, a body on the *same* side of the equator with the spectator, comes to the east *after* it is risen; a body on the *contrary* side, *before* it rises; and a body *in* the equator, when it rises. As this figure may represent the western hemisphere, the same circles ea, EQ, tm, will represent the motion of the heavenly bodies as they descend from the meridian above the horizon to the meridian below. Hence, a body is at its greatest altitude when it is upon the meridian; and at equal altitudes at equal distances on each side of the meridian, if the body have not changed its declination. Now as all the *fixed stars* constantly retain their same situations, each must always rise and set at the same point of the horizon, and continue for the same length of time above the horizon; in these bodies, therefore, there will be no variety of appearance. But the *sun*, *moon*, and *planets* are continually changing their situation, and are sometimes on one side of the equator and sometimes on the other. We will therefore next describe the phænomena attending these bodies.

43. The semicircle COL represents one half of the ecliptic, or one half of the sun's apparent yearly motion; and let C be the first point of capricorn, and L the first point of cancer. If we therefore suppose the *sun* to be at any point p, on the *contrary* side of the equator to that of the spectator, on that day, by the diurnal rotation of the earth, he appears to describe the circle mpn rst; when he is at m, it is midnight; when he comes to s, he rises; and when he comes to t it is noon; and from noon to midnight he will describe the path $tsrnbm$ in the western hemisphere. Now as ms is greater than st, the sun will be longer below the horizon than above, and therefore the nights will be longer than the days; and the sun rises at s from the east towards the south, and sets as far from the west towards the south. When the sun is *in* the equator at O, his diurnal motion is then QOE; and as $QO=OE$, he is as long below as above the horizon, and the days and nights are equal; and he rises in the east at O, and sets in the west. When the sun is at any point q, on the *same* side of the equator with the spectator, on that day he describes, by his diurnal motion, the circle $abcdqe$, and as ab is less than be, he is longer above the horizon than below it, and the days are longer than the nights; and he rises at b from the east O towards the north, and sets from the west towards the north. It is manifest therefore, that the length of the days increases from the time the sun leaves C, the first point of capricorn, till he comes to L, the first point of cancer; and then they gradually decrease again from the time the sun leaves L till he comes to C. If ae, mt, be equidistant from EQ, then will $be=ms$, and $ab=st$; hence, when the sun is at equal distances from the equator, and on opposite sides, the length of the day at one time is equal to the length of the night at the other, and the length of the night at the former is equal to the length of the day at the latter time. At every place therefore, the sun, in the course of a year, is half a year above the horizon and half a

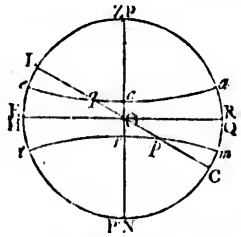
year below.* Hence, the different lengths of days and nights, and the variety of seasons, arise from the sun being sometimes on one side of the equator, and sometimes on the other, or from the ecliptic CL being inclined to the equator, or from the axis of the earth which coincides with PP', being inclined to the ecliptic CL, the path of the earth.

44. As the sun illuminates one half of the earth, or 90° all round about that place to which he is vertical, when he is *in* the equator, he will just illuminate as far as each pole; when he is on the north side of the equator, the north pole will be within the illuminated part, and the south pole will be in the dark part; and when the sun is on the south side of the equator, the south pole will be within the illuminated part, and the north pole in the dark part. When the sun is got to 23° 28′, (his greatest distance from the equator,) he then illuminates the earth to 23°. 28′ on the other side of the pole; and if two circles be described about the poles at that distance, that about the *north* pole is called the *arctic* circle, and that about the south pole is called the *antarctic* circle. These are also called *polar* circles. If two circles be described upon the earth, parallel to the equator, at the distance of 23°. 28′ from it, they are called *tropical* circles, or the *tropics*.

45. Let Hw, Rv, xy, be small circles parallel to EOQ. Now it is manifest, that a body which describes the circle Rv, or any circle xy nearer to P, never sets; and such circles are called circles of *perpetual apparition*; and the stars which describe them are called *circumpolar* stars. The body which describes the circle wH, just becomes visible at H, and then it instantly descends below the horizon; but the bodies which are nearer to P' are never visible. Such are the phænomena of the diurnal motions of the heavenly bodies, when the spectator is situated any where between the equator and the poles; and this is called an *oblique* sphere, because all the bodies rise and set obliquely to the horizon.



46. If the spectator be at the equator, then E coincides with Z, because Z answers to the place of the spectator on the earth, and EOQ coincides with ZON, consequently $P'OP$ coincides with HOR. Hence, as the equator EOQ is perpendicular to the horizon, the circles ace, mrt, parallel to EOQ, are also perpendicular to the horizon, and therefore the horizon bisects them. To a spectator therefore at the equator, all the heavenly bodies in their diurnal motion are as long above the horizon as below; and they rise and set at right angles to it, on which account, this is called a *right* sphere. Hence, at the equator the days and nights are each always 12 hours long. There will however be some variety of seasons, as the sun will recede to L and C, 23°. 28′ on each side of the spectator. When the sun is in the equator, he will be vertical to the spectator at noon; for one half of the year he will come to the meridian to the north of the zenith, and the other half of the year, to the south of the zenith.



47. If the spectator be at the *pole*, then P coincides with Z, and PP' coincides with ZN; consequently EOQ coincides with HOR. Hence, the circles ea, tm, parallel to the equator, are also parallel to the horizon; therefore as a body in its diurnal motion describes a circle parallel to the horizon, all the fixed stars which are at any time above the horizon, must continue above the horizon, and those which are below, must continue below; and the spectator always sees the same face of the heavens, because none of the bodies, by their diurnal motion, can neither rise or set. This is called a *parallel* sphere, because the diurnal motion of all the heavenly bodies is parallel to the horizon. But as the sun describes the ecliptic COL, and $CO=OL$, and the part CO is never brought above the horizon, by the diurnal motion, and the part OL is never carried below, the sun must be half a year below the horizon, and half a year above, so that there is half a year day, and half a year night.

48. All those things will be very evident by means of a celestial globe. Place the axis obliquely to the

* This is not accurately true, because the sun's motion in the ecliptic is not uniform, on which account he is not exactly as long on one side of the equator as on the other; the summer half year, or the time from the sun's leaving the first point of aries till he comes to the first point of libra, is about 8 days longer than the winter half year.

horizon,

horizon, and you will see that all the circles parallel to the equator are cut into two unequal parts; and the more you elevate the pole, or the nearer you bring the spectator to the pole, the greater will be the difference of those parts; that is, as the spectator approaches the pole, the length of the days will be increased, and that of the nights decreased, when the sun is on the *same* side of the equator as the spectator; and the length of the days will be decreased and that of the night increased, when the sun is on the *contrary* side. If you bring the poles down to the horizon, you will see that all the parallels to the equator are cut into two equal parts, so that there is always equal day and night to a spectator at the equator. If you bring the pole to the zenith, or if the spectator be at the pole, and you turn the globe about, one half of the ecliptic will continue above the horizon and the other half below, so that the sun will be half a year above the horizon, and half a year below. Thus it appears, that as you travel from the equator to the poles, for one half of the year the length of the day will increase from 12 hours to half a year; and for the other half of the year, the length of the night will increase from 12 hours to half a year.

49. The greater degree of heat in summer than in winter, arises from three causes. 1. The sun is a longer time above the horizon in summer than in winter. 2. The sun rising higher above the horizon in summer than in winter, more rays will fall upon the earth in the former than in the latter season. 3. The higher the sun is above the horizon, the greater is the force of the rays. Moreover, the parts which are heated, retain their heat for some time, which, with the additional heat acquired, make it continue to increase after the middle of the summer; and this is the reason why July is generally hotter than June. And for the same reason, we frequently find it hotter at 2 o'clock in the afternoon than it is at noon. Likewise, bodies retain their cold for some time, and thus it happens, that January is generally colder than December.

50. The orbits of all the planets, and of the moon, are inclined to the equator, and therefore their motions amongst the fixed stars must be in circles inclined to the equator: hence, similar phænomena to those of the sun will take place in the times of their respective revolutions. All the different appearances must therefore take place in the moon, in the course of a month. It is evident also, that these variations must be greater or less, as the orbits are more or less inclined to the equator; hence, they must be greater in the moon than in the sun, the moon's orbit being more inclined to the equator than the sun's.

51. The altitude of the pole of the heavens above the horizon, is equal to the latitude of the place. For the arc ZE (fig. 2d. page x) is the measure of the latitude of the place; but $PE=ZR$, each being 90°; take away ZP which is common to both, and $EZ=PR$. Hence, PZ is the complement of latitude.

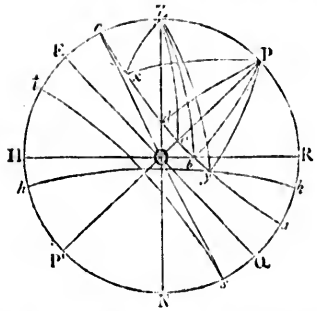
52. If there were a star exactly in the point P, then by taking its altitude PR above the horizon by a quadrant, and correcting it for refraction, you would get the latitude of the place; but as there is not a star in that place, the latitude may be found by observing the greatest and least altitude of a circumpolar star, applying the correction for refraction, and half the sum will be the altitude of the pole. For if yx be the circle described by a circumpolar star, then as $Px=Py$, we have $xR=PR+Px=PR+Py$, and $yR=PR-Py$; add these equations together, and we have $xR+yR=2\,PR$, therefore $\frac{1}{2}(xR+yR)=PR$ the latitude.

53. The angle which the equator makes with the horizon, is equal to the complement* of the latitude of the place. For HE is the measure of the angle HOE: and as $HZ=90°$, HE is the complement of ZE, and ZE is the latitude.

54. Hence, the latitude of a place may be found thus, Let sOe (fig. page xiv) be the ecliptic, and then when the sun comes to e it is at its greatest north declination, at which time the days are longest, and at t its south declination is the greatest, at which time the days are shortest; also, eH is the meridian altitude of the sun on the longest day, and tH is the meridian altitude on the shortest day. Now as $tE=Ee$, we have $eH=EH+Ee$, and $tH=EH-Et=EH-Ee$; add these equations together, and we get $EH+tH=2\,EH$, therefore $\frac{1}{2}(eH+tH)=EH$ the complement of the latitude. The complement of latitude is therefore equal to half the sum of the true meridian altitudes of the sun on the longest and shortest days.

55. Half the difference of the meridian altitudes of the sun on the longest and shortest days, is equal to the inclination of the equator to the ecliptic. For the difference between eH and tH is et, and the half of et is Ee, which measures the angle EOe, the inclination of the equator to the ecliptic.

* The *complement* of an arc, or angle, is what it wants of 90°; and the *supplement* is what an arc, or angle, wants of 180°. Also, co-altitude means the complement of the altitude, and the same for other quantities.



56. Let *hk* be a circle parallel to the horizon *HOR*, and 18° below it; and let *aybcdxe* be any circle parallel to the equator, described by an heavenly body in the eastern hemisphere; and draw the circles *Py*, *Pb*, *Pd*, *Px*, and *Zy*, *Zb*, *Zc*, *Zx*. Now (as has been already explained) when the sun comes to *y*, twilight begins; when any body comes to *b*, it rises; when it comes to *c*, it is at the middle point between *a* and *e*; when it comes to *d*, it is due east; and let *x* be the place at any other time. Now let us suppose this body to be the sun, and not to change its declination in its passage from *a* to *e*; and let us suppose a clock to be adjusted to go 24 hours in one apparent diurnal revolution of the sun, or from the time it leaves any meridian till it returns to it again; then the sun will always approach the meridian at the rate of 15° in an hour, also, the angle which the sun describes about the pole, varies at the same rate, because any arc *xe*, which the sun has to describe before it comes to the meridian, measures the angle *xPe*, called the *hour angle*. If therefore we suppose the clock to shew 12 when the sun is on the meridian at *a* and *e*, it will be 6 o'clock when he is at *c*. And as the sun describes angles about the pole *P* at the rate of 15° in an hour, the angle between any circle *Px*, passing through the sun at *x*, and the meridian *PE*, converted into time at the rate of 15° for an hour, will give the time from *apparent* noon, or when the sun comes to the meridian. Also, when the sun is at any point *x*, the angle *xZP* is his azimuth from the north; *xZ* is the complement of his altitude; and *xP* is the complement of his declination. This being premised, we shall proceed to give the solution of a few problems which will be found very useful in practical astronomy and navigation.

57. The declination of a body, is the difference between its meridian altitude, and the complement of the latitude. For the declination $Ee = He - HE$, where *HE* is the meridian altitude, and *HE* is the complement of latitude, by art. 53. Also, the declination $Et = HE - Ht$, and *Ht* is the meridian altitude.

58. *Given the latitude of the place, and the declination of the sun, to find the time of his rising, and his azimuth at that time.*

Let *ae* be the parallel of declination described by the sun on the given day; then when the sun comes to *b*, he rises. Now in the spherical triangle *bZP*, $bZ = 90°$ (the zenith being 90° from the horizon), bP = the complement of the sun's declination, and PZ = the complement of latitude; and by spherical trigonometry, radius : cotan. *bP* : : cotan. *ZP* : cos. *ZPb*, or, radius : tan. decl. : : tan. lat. : cos. *ZPb*. the *hour angle* from *apparent* noon; which converted into time at the rate of 15° for an hour, and substracted from 12 o'clock, gives the *apparent* time of rising, or the hour at which the sun rises, supposing it be 12 o'clock when he comes to the meridian.

Also, sin. *ZP* : radius : : cos. *bP* : sin. *PZb*, or, cos. lat. : radius : : sin. decl. : cos. of the *azimuth* from the north.

Ex. Given the latitude of Cambridge 52°. 12′. 35″, to find the time of the sun's rising on the longest day, and his *azimuth* at that time; assuming the sun's greatest declination 23°. 28′.

By logarithms the operation will stand thus:

rad.	- -	10,0000000
tan. 23°. 28′. 0″	-	9,6376106
tan. 52. 12. 35	-	10,1104699
cos. 124. 2. 47*	-	9,7480805

Convert this into time, and it gives 8h. 19′. 6″, which substracted from 12, there remains 3h. 40′. 54″, the *apparent* time at which the sun rises. Also,

cos. 52°. 12′. 35″	-	0,2127004 ar. co.
radius -	-	10,0000000
sin. 23. 28	-	9,6001181
cos. 49. 28. 9	- -	9,8128185

Hence, on the longest day, the sun rises 49°. 28′. 9″ from the north.

59. *To find the sun's altitude at 6 o'clock, on the same day.*

At 6 o'clock the sun is at *c*, and *ZPc* is a right angle; hence, radius : cos. *ZP* : : cos. *Pc* : cos. *Zc*, or, radius : sin. lat. : : sin. dec. : sin. of the *altitude*.

* This log. 9,7480805 is found in the tables to be the log. cosine of 55°. 57′. 15″, but as the angle is manifestly greater than 90°, we must take its supplement. In the solution of spherical triangles, ambiguous cases will frequently arise, for the determination of which, the reader is referred to Dr. Maskelyne's excellent Introduction to Taylor's Logarithms; or to Mr. Vince's *Treatise on plane and spherical Trigonometry*, containing an explanation of the *Construction and Use of Logarithms*.

By

By logarithms the operation is thus:

radius	- - -	10,0000000
fin. 52°. 12′ 35″	-	9,8977695
fin. 23. 28. 0	-	9,6001181
fin. 18. 20. 32 the *altitude*		9,4978876

60. *To find the time when the Sun comes due eaſt, and his altitude at that time, on the ſame day.*

The ſun is due eaſt when he comes to the prime vertical at d, and dZP is a right angle; hence, coſ. ZP : radius :: coſ. dP : coſ. Zd, or, ſin. lat. : radius :: ſin. dec. : ſin. of the *altitude*.

Alſo, radius : cotan. Pd :: tan. PZ : coſ. ZPd, or, radius : tan. dec. :: cotan. lat. : coſ. ZPd the *hour angle*, which converted into time, gives the time from *apparent* noon.

By logarithms, the operation is thus:

ſin. 52°. 12′. 35″	-	0,1022305 ar. co.
radius	- - -	10,0000000
ſin. 23. 28. 0	- -	9,6001181
ſin. 30. 15. 31 the *altitude*		9,7023486
radius	- - -	10,0000000
tan. 23°. 28′. 0″	-	9,6376106
cot. 52. 12. 35	-	9,8895301
coſ. 70. 19. 44 = ZPd	-	9,5271407

This angle 70°. 19′. 44″ converted into time, gives 4h. 41′. 19″ the time from *apparent* noon.

61. *Given the latitude of the place, the Sun's declination and his altitude, to find the hour.*

Let x be the ſun's place; then in the triangle xZP, xZ is the complement of the altitude, xP is the complement of declination, and PZ is the complement of the latitude, all which are given: hence, by ſpherical trigonometry, ſin. $xP \times$ ſin. ZP : rad. :: $\sqrt{\text{ſin. } \frac{1}{2}(Px+PZ+Zx) \times \text{ſin. } \frac{1}{2}(Px+PZ-Zx)}$: coſ. $\frac{1}{2}ZPx$, therefore the hour angle ZPx is known, which, converted into time, gives the time from *apparent* noon.

Ex. Given the latitude 34°. 55′ N. the ſun's declination 22°. 22′. 57″ N. and his true altitude 36°. 59′. 39″, to find the *apparent* time.

Here, ZP=55°. 5′, Zx=53°. 0′. 21″, Px=67°. 37′. 3″; and the operation by logarithms is thus:

Px=67°. 37′. 3″	- -	ar. co. ſin. 0,034019
ZP=55. 5. 0	- -	ar. co. ſin. 0,086193
Zx=53. 0. 21		
Sum 175. 42. 24		
½ Sum 87. 51. 12	- - -	ſin. 9,999694
Zx=53. 0. 21		
Dif. 34. 50. 51	- - -	ſin. 9,756932
		2)19,876838
29. 47. 44 = ½ZPx	- - -	coſ. 9,938419

Hence, ZPx=59°, 35′. 28″, which converted into time, gives 3h. 58′. 22″. the time from *apparent* noon.

This problem is uſed in finding the longitude by the lunar method.

62. *Given the latitude of the place, and the Sun's declination, to find the time when the twilight begins.*

Twilight begins when the ſun comes to y, 18° below the horizon; hence, Zy=108°; alſo, Py is the complement of declination, and ZP is the complement of latitude; hence, ſin. $yP \times$ ſin. ZP : rad. :: $\sqrt{\text{ſin. } \frac{1}{2}(PZ+Py+108°) \times \text{ſin. } \frac{1}{2}(PZ+Py-108°)}$: coſ. $\frac{1}{2}yPZ$, therefore yPZ is known, which converted into time, gives the time from *apparent* noon, when twilight begins.

This rule being the ſame as the laſt, the method of calculation is the ſame.

63. *To find where the longeſt day is 24 hours.*

Let QR (ſee fig 2d on page x)=23°. 28′, then the ſun on the longeſt day deſcribes the circle Rv, and this circle juſt touching the horizon at R, it will wholly be above the horizon, therefore the ſun continues above the horizon for its whole apparent diurnal motion, that is, for 24 hours. Now QR=EH=the complement of latitude, by article 53; hence, the latitude is 66°. 32′; therefore the ſpectator is at the arctic circle, as appears by art. 44.

64. To a ſpectator at the ſame place, on the ſhorteſt day the ſun is at the diſtance EH on the other ſide of the equator, and at that time he deſcribes the circle wH in his diurnal motion, and therefore he continues 24 hours below the horizon; therefore the longeſt night is 24 hours. Now we have already obſerved (art. 45.), that as a ſpectator moves from the equator to the poles, the length of the day increaſes from 12 hours to half a year; hence, the longeſt day is more than 24 hours within the polar circle, and leſs than 24, on every other part of the earth.

65. *To find at what time of the year the twilight laſts juſt all night.*

Let

Let *ae* be the parallel described by the sun at that time, then *Ra* must be 18°, for at that distance below the horizon, twilight begins; hence, 18°+dec. $Qa = RQ = EH =$ comp of latitude, by art. 53.; therefore, by transposition, sun's dec. = comp. of lat.—18°. But if the sun be on the other side of the equator at *m*, then $Rm = 18°$, and 18°—declin. $Qm = RQ = EH =$ comp. of lat. therefore sun's dec. = 18°—comp. of latitude. Look therefore into the *Nautical Almanac*, and see on what day the sun has this declination, and you have the time required.

Ex Let the latitude be 52°. 12′ N. then its complement is 37°. 48′; hence, the declination is 37°. 48′ —18° = 19°. 48′ N. which answers to about May 19, and July 24, at which times there is twilight just all night. Therefore from May 19 to July 24 there will be twilight all night.

66. The greatest value of *Qa* is 23°. 28′, therefore when *a R* is 18°, the greatest value of *QR* is 41°. 28′; if therefore *QR* be greater than 41°. 28′, then *Ra* must always be greater than 18°, and therefore there will be no twilight when the sun is at *a*; hence, when the complement of latitude is greater than 41°. 28′, or when the latitude is less than 48°. 32′, there never can be twilight all night.

Astronomical Terms, arising from different Situations of the Spectator upon the Earth.

67. By means of the two tropics and two polar circles upon the earth, the whole surface is divided into five parts, called *zones*: that which is included between the tropics, is called the *torrid zone*: the two parts lying between the tropics and the polar circles, are called the *temperate* zones: the two parts within the polar circles are called the *frigid* zones. The inhabitants of these zones are distinguished by the different directions of their shadows arising from the sun. They who live between the tropics, or in the *torrid* zone, have the sun vertical to them at noon twice in the year; thus, an inhabitant in 10° north latitude has the sun vertical to him when its declination is 10° north. And, in general, this will happen when the latitude of the inhabitant is equal to the declination of the sun, and both of the same kind, that is, both north, or both south. At all other times, when the sun comes to the meridian, the shadow is either to the north or the south of the zenith. The inhabitants of this zone are called *Amphiscii*, that is, having both kinds of meridian shadows.

68. They who live in the *temperate* zones, have their shadows at noon always the same way, and are therefore called *Heteroscii*, that is, having only one kind of meridian shadow.

69. They who live in the *frigid* zones, have, when the days are more than 24 hours long, the sun moving all round them, and therefore their shadows are cast all round them, and hence they are called *Periscii*.

70. The inhabitants of the earth have also been distinguished into three kinds, in respect to their relative situations. They who live at opposite points of the same parallel to the equator, are called, in respect to each other, *Periæci*. These have the same seasons of the year; but it is midnight to one when it is noon, or midday, to the other.

71. They who live under the same meridian and in opposite parallels, that is, in two parallels to the equator, and equidistant from it, are called *Antæci*. These have day and night at the same time, but different seasons, it being summer with one when it is winter with the other.

72. They who live under opposite meridians and opposite parallels, are called *Antipodes*. These have their days and nights, and also their seasons, opposite, that is, it is day with one when it is night with the other, and summer with one when it is winter with the other.

To find the Right Ascension and Declination of the Heavenly Bodies.

73. The foundation of all astronomy is to determine the places of the fixed stars, in order to find, by a reference to them as fixed objects, the places of the other bodies at any given times, by which means you can trace out their paths in the heavens. The positions of the fixed stars are found from observation, by finding their right ascensions and declinations, for it is manifest, that if we know the right ascension *Am*, and declination *ms*, we know the point *s* (see fig. page viii). Now the *declination* is found thus. Find the latitude of the place by the 52d or 54th articles, and then we know *EH* the complement of latitude (see the last figure). By the astronomical quadrant, described in art. 17, find the true meridian altitude *He* of the body; then the difference between *EH* and *He* is *Ee*, the declination required.

74. To find the *right ascension* of a body. As the earth revolves uniformly about its axis, the apparent daily motion of all the heavenly bodies, arising from this motion of the earth, must be uniform; and as this motion is parallel to the equator, the interval of the times in which any two stars pass over the meridian, is in proportion to the corresponding arc of the equator which passes over the meridian in the same interval. Now let a clock be adjusted to go 24 hours in the time the earth makes a rotation about its axis, then it describes about its axis an angle of 15° every hour, and every point of the equator, and all the circles which are parallel to it, describe 15° in an hour; and all the stars appear to revolve at the same rate; so that if two stars should differ 15° in right ascension, one of them would pass over the meridian an hour after the other. And, in general, if you take the interval of the times in which any two stars pass the meridian, and convert that interval of time into degrees, at the rate of 15° for an hour, you will have the difference of the right ascensions of those two stars; if therefore you know the right ascension of one of the stars, you will know the right ascension of the other. Thus, by knowing the right ascension of one star, and comparing all the other heavenly bodies with

it, you will get their right ascensions. For the method of finding the right ascension of some one star, we refer the Reader to Mr. VINCE's *Complete System of Astronomy*. The time when any body comes to the meridian is known by its passage over the middle perpendicular wire of the transit telescope, as described in art. 18. The right ascension is reckoned both by time and by degrees; thus, we say a star has 15°, 30°, 45°, &c. right ascension, or its right ascension is 1 hour, 2 hours, 3 hours, &c.

75. But a more ready and practical method of finding the right ascension of a body, is thus: Let a clock be adjusted to go 24 hours in the time in which the earth revolves about its axis, in which time all the fixed stars appear to have made one revolution; and a clock thus adjusted is said to be adjusted to *sidereal* time. Now let the clock begin its motion from 0h. 0′. 0″. at the instant the first point of aries is upon the meridian, from which point we begin to reckon the right ascension; then, when any star comes to the meridian, the clock would show the apparent right ascension of the star, provided it was subject to no error, because it would then show, at any time, how far the first point of aries was from the meridian, reckoning 15° for every hour. But as every clock is subject to err, we must be able at any time to find its error. To do this, we must, when a star, whose apparent right ascension is known, passes the meridian, compare its right ascension with the right ascension shown by the clock, and the difference will show the error of the clock. For instance, let the apparent right ascension of *aldebaran* be 4h. 23′. 50″. when it passes over the meridian, and at that time suppose the clock to show 4h. 23′. 56″, then the clock is at that time 6″ too fast; and by thus continually comparing the clock with stars whose right ascensions are known, you will always have the error of the clock; and you will also see at what rate it gains or loses, called the *rate of its going*. The error of the clock, and the rate of its going being thus ascertained, if the time of the transit of any body be observed, and the error of the clock be applied, you will have the right ascension of the body.

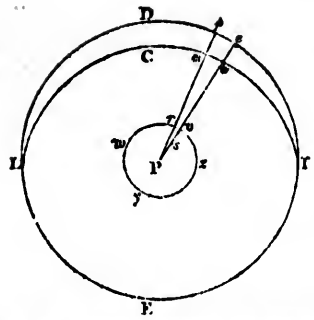
76. Thus we determine the declination *ms*, and right ascension *Am*, of any heavenly body *s*; and from these we can, by spherical trigonometry, find the latitude *ns* and the longitude *An* (see fig. page 8); and it is manifest, that if we know these two quantities, we shall also know the place *s* of the body; and it is frequently more useful to make use of the latitude and longitude, than it is the declination and right ascension, for finding the place of a body; it is necessary therefore, in such cases, to compute the latitude and longitude from the right ascension and declination; for the method of doing which we refer the reader to the above-mentioned work.

77. Being thus able to find the situation of a body in the heavens, we can every day determine the place of all the heavenly bodies which have any motions, and thus we find out the paths which they describe, and how fast they move.

On the Equation of Time.

78. The best measure of time which we have, is a clock regulated by the vibration of a pendulum. But with whatever accuracy a clock may be made, it must be subject to go irregularly, partly from the imperfection of the workmanship, and partly from the expansion and contraction of the materials by heat and cold by which the length of the pendulum, and consequently the time of a vibration, will vary. As no clock therefore can be depended upon for keeping time accurately, it is necessary that we should be able at any time to ascertain how much it is too fast or too slow, and at what rate it gains or loses. For this purpose, it must be compared with some motion which is uniform, or of which, if it be not uniform, you can find the variation. The motions of the heavenly bodies have therefore been considered as most proper for this purpose. Now as the earth revolves uniformly about its axis, the apparent diurnal motion of all the heavenly bodies about the axis must be uniform. If a clock therefore be adjusted to go 24 hours from the passage of any fixed star over the meridian till it returns to it again, its rate of going may be determined by comparing it with the transit of any fixed star, and observing whether the interval continues to be 24 hours; if not, the difference shows how much it gains or loses in that time. A clock thus adjusted is said to be adjusted to *sidereal* time; and all the sidereal days are equal. But all the *solar* days are not equal, that is, the intervals from the sun's leaving the meridian till it returns to it, are not all equal, so that if a clock be adjusted to go 24 hours in one interval, another interval will be performed in more or less than 24 hours, and thus the sun and the clock will not agree, that is, the clock will not continue to show 12 when the sun comes to the meridian.

79. For let *P* represent the pole of the earth, *vwyz* its equator, and suppose the earth to revolve about its axis, in the order of the letters *vwyz*; and let *YDLE* be the celestial equator, and *YCL* the ecliptic, in which the sun moves according to that direction.



Let *s* be the place of a ſpectator, and draw the meridian *Pvae*, and let us ſuppoſe the ſun to be at *a* on the meridian. Then when the earth has made one revolution about its axis, the ſpectator at *s* will come again into the ſame ſituation, and be again on the ſame meridian *Pvae*; but the ſun is not now again on the meridian, becauſe he has moved forward in the ecliptic towards *L*; if therefore *m* be the point where the ſun is when he next comes to the meridian, or rather when the meridian overtakes him, and you draw the meridian *Pvmp*, then the earth, after it has made a revolution about its axis, has deſcribed the angle *vPr* before the ſpectator at *s* be brought again into the meridian *Pmp* of the ſun. Now the angle *vpr* is meaſured by the arc *pc*, which is the increaſe of the ſun's right aſcenſion in the time he moves from *a* to *m*, or in a *true* ſolar day; hence, the length of a *true* ſolar day is *equal to the time of the earth's rotation about its axis, together with the time of deſcribing an angle equal to the increaſe of the ſun's right aſcenſion in a true ſolar day*. Now if the ſun moved uniformly, and alſo in the equator *YDLE*, this increaſe *op* would be always the ſame in the ſame time, and therefore the ſolar days would be all equal; but the ſun moves in the ecliptic *YCL*, and therefore *if* its motion were *uniform*, equal arcs (*am*) upon the ecliptic would not give equal arcs (*op*) upon the equator. But the motion of the ſun in the ecliptic is *not* uniform, and hence alſo *am*, deſcribed in a given time, is ſubject to a variation, and conſequently *op* is ſubject to a variation. Hence, the increaſe *op* of the ſun's right aſcenſion in a *true* ſolar day, varies from two cauſes; 1ſt. Becauſe the ecliptic, in which the ſun moves, is inclined to the equator; 2d. Becauſe his motion in the ecliptic is not uniform; therefore the length of a *true* ſolar day is ſubject to a continual variation; conſequently a clock which is adjuſted to go 24 hours for any one true ſolar day, will not continue to ſhow 12 when the ſun comes to the meridian; becauſe the intervals by the clock will continue equal (the clock being ſuppoſed neither to gain or loſe), but the intervals of the ſun's paſſage over the meridian are not equal.

80. As the ſun moves through 360° of right aſcenſion in $365\frac{1}{4}$ days, therefore $365\frac{1}{4}$ days : 1 day . : 360° : 59′. 8″, 2 the increaſe of right aſcenſion in 1 day, *if* the increaſe were uniform, or it would be the increaſe in a *mean* ſolar day, that is, if the ſolar days were all equal; for they would be all equal, if the ſun's right aſcenſion increaſed uniformly, as appears by the laſt article*. If therefore a clock be adjuſted to go 24 hours in a *mean* ſolar day, it will not continue to coincide with the ſun; that is, to ſhow 12 when the ſun comes to the meridian, becauſe the *true* ſolar days differ in length from a *mean* ſolar day, but the ſun will paſs the meridian, ſometimes *before* 12, and ſometimes *after* 12, and this difference is called the *equation of time*. A clock thus adjuſted, is ſaid to be adjuſted to *mean* ſolar time. The time ſhown by the clock is called *true* or *mean* time; and that ſhown by the ſun is called *apparent* time; thus, when the ſun comes to the meridian, it is ſaid to be 12 o'clock, *apparent* time. Hence, the time ſhown by a ſun-dial is *apparent* time, and therefore a dial will differ from a clock, by how much the equation of time is on that day. When therefore you ſet a watch by the dial, you muſt ſee what the equation of time is upon that day, and allow for it; for inſtance, if the equation be 3 minutes, and the watch be faſter than the ſun, then you muſt ſet your watch 3 minutes before the time ſhown by the dial. Now aſtronomers, when they compute tables of the equation of time for every day of the year, ſet the ſun and clock together, when the ſun is at his apogee, and then they calculate what is the difference between the ſun and the clock, for every day at noon, and inſert them in a table, ſtating how much the clock is before or after the ſun. For the methods of making theſe calculations, we muſt refer the reader to the Treatiſe before-mentioned. The inclination of the equator to the ecliptic, upon which the equation of time partly depends, and the place of the ſun's apogee, when the clock and ſun ſet off together, being both ſubject to vary, the equation of time for the ſame days of the year, will every year vary, and therefore it muſt be calculated every year. Beſides the time when the ſun is in his apogee, there are three other times of the year when the clock and ſun agree, or when *mean* and *apparent* times are the ſame.

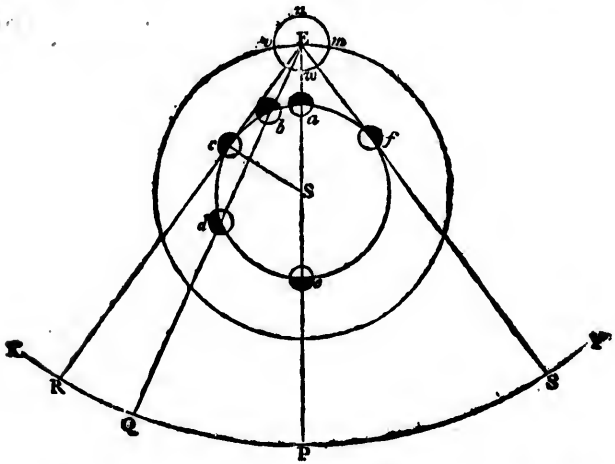
81. Whenever it is required to make any calculations from aſtronomical tables, and the time given is *apparent* time, the equation of time muſt be applied in order to convert it into *mean* time; and for that time the computations muſt be made, becauſe all tables are conſtructed for *mean* motions. Thus, if it were required to find

* As the earth deſcribes an angle of 360°. 59′. 8″,2 about its axis in a *mean* ſolar day of 24 hours, and an angle of 360° in a *ſidereal* day, therefore 360°, 59′. 8″,2 : 360° :: 24h. : 23h. 56′. 4″,098 the length of a ſidereal day in *mean* ſolar time, or the time from the paſſage of a fixed ſtar over the meridian till it returns to it again.

the sun's place on any day at *apparent* noon, the equation of time must be applied to 12 o'clock, and then the sun's place must be computed from the tables for that time. All the articles in the *Nautical Almanac*, answering to noon, are computed in this manner.

On the Solar System.

82. The sun is placed in the center of the system, about which the planets revolve in the following order, reckoning from the sun: *mercury*, *venus*, the *earth*, *mars*, *jupiter*, *saturn*, and the *georgian*; these are sometimes called *primary* planets. Some of these planets have bodies revolving about them; the earth has one; jupiter has four; saturn has seven; and the georgian has six; these are called *secondary* planets, *satellites*, or *moons*. There are also other bodies which revolve about the sun, called *Comets*, which move in orbits very elliptical, and extend to a very great distance beyond the orbits of the primary planets. The sun, the primary planets, the secondary planets, and the comets, compose what is called the *Solar System*. The two planets which are nearer to the sun than the earth is, are called *inferior* planets; and the other five which are further from the sun than the earth is, are called *superior* planets. All the other bodies in the heavens are fixed stars, and at such immense distances beyond the solar system, that their apparent relative situations are not at all altered by the motion of the earth in its orbit; we may therefore consider them as placed in the concave service of a sphere, having the earth for its center; and to these we refer the motions of the bodies in our system. The orbits of the primary planets are ellipses, having the sun in one of the foci; but they are so very nearly circles, that, for our present purpose, we may consider them as circles having the sun in the center.



83. Let S be the sun, E the earth, *abcdef* the orbit of one of the *inferior* planets, *venus* or *mercury*; $X\Upsilon$ the sphere of the fixed stars; draw $EnSeP$, $EbdQ$, and let EcR, EfS be tangents to the orbit of the planet, and let n, b, c, d, e, f, be so many different situations of the planet; then as the planets are opaque bodies, that half which is next to the sun is enlightened, and the other half is dark, as represented in the figure. The situation n is called *inferior* conjunction, and the situation e is called *superior* conjunction. Now it is manifest, that at a, the dark part only of the planet is towards the earth, and therefore the planet is then invisible; at b, a part of the enlightened face is towards the earth, and therefore part of the planet will be visible, and will look like the moon before it comes to its first quarter; at c, one half of the enlightened part of the planet will be turned towards the earth, and it will look like the moon at its first quarter; at d, more than half the enlightened part of the planet will be towards the earth, and it will look like the moon between its second quarter and full; at e, the whole enlightened part of the planet will be next the earth, and the planet will appear to shine with a full face, like the moon at its full; and from e through f to a, the appearances will be the same in the contrary order. These are the *phænomena* which an inferior planet must have; and as, by viewing *venus* and *mercury* with a

telescope, they are found to have all these phænomena, we conclude that they must be inferior planets. Now the angle *cES* is the greatest distance at which these planets appear from the sun, or the greatest elongation; and as this angle is found to be greater for *venus* than it is for *mercury*, we know that *mercury* is nearer to the *sun* than *venus*.

84. When the planet is at *a*, it appears in the heavens amongst the fixed stars at *P*; when it is at *b*, it appears at *Q*; when it is at *c* it appears at *R*; when it is at *d*, it appears at *Q*; when it is at *e*, it appears at *P*; when it is at *f*, it appears at *S*; and when it returns to *a*, it appears at *P*; at which place also the sun appears. It is manifest therefore, that an inferior planet appears to move backwards and forwards in the heavens, from *S* to *R*, and from *R* to *S*; and therefore there must be two points where the planet appears stationary; for if a planet first appear to move one way and then back again in a contrary direction, the motion must first cease in one direction before it takes place in a contrary direction. We have here supposed the earth to be at rest at *E*, but all the same phænomena will take place if we suppose the earth to be in motion; for an inferior planet moves faster about the sun than the earth does, and therefore when it comes into inferior conjunction at *a*, it will immediately leave the earth behind it, and have the same relative situations in respect to the earth and sun, as we have described above. If the earth were at rest, the two stationary points would be at *R* and *S*, when the planet was on each side at its greatest elongation from the sun (appearing at P); but as the earth is in motion, these will not be the stationary points The true stationary points (which call *P* and *S*) are determined, by finding when a line joining the earth and planet continues parallel to itself for a very small time.

85. The earth and all the planets revolve about the sun in the direction *XY*; that direction is therefore *direct*, and the contrary direction *YX* is *retrograde* (see art. 19.) Hence, an inferior planet appears to move direct, from the stationary point *R* before it comes to the superior conjunction, till it comes to the stationary point *S* after; and it appears to move retrograde, from the stationary point *S* before it comes to the inferior conjunction, till it comes to the stationary point *R* after; therefore whilst an inferior planet is passing through its inferior conjunction, it is retrograde; and whilst it is passing through its superior conjunction, its motion is direct. As the arc *e f* is greater than the arc *fac*, the planet is longer direct than it is retrograde. It appears also from hence, that the two inferior planets will constantly attend the sun, receding to a certain distance on each side, and then returning again to him. As the orbits of the planets are not circles, but ellipses, the greatest elongations of *venus* and *mercury* are not always the same; the greatest elongations of *venus* are from 44°. 57′ to 47°. 48′; and of *mercury* from 17°. 36′ to 28°. 20′. As *mercury* recedes but to a small distance from the sun, it is not often that it can be seen, as it must be in the most favourable situation for that purpose, and the atmosphere must also be very clear at the same time.

86. When *venus* is at the distance of 39°. 44′ from the sun, between its inferior conjunction and its greatest elongation, she then gives the greatest quantity of light to the earth; and at that time her brightness is so great as to cause a shadow. And if at that time she be at her greatest north latitude, her brightness is so great that she is seen by the naked eye at any time of the day when she is above the horizon; for when her north latitude is the greatest, she rises highest above the horizon, and her rays coming through less of the atmosphere, she is more easily seen This happens once in about 8 years, *venus* and the *earth* returning very nearly to the same parts of their orbits after that interval of time.

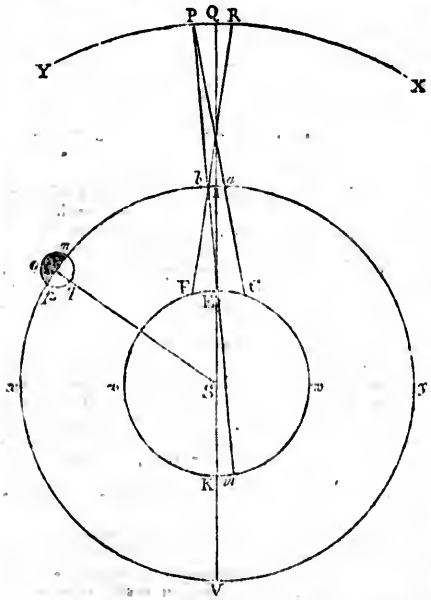
87. *Venus* is a *morning* star from inferior to superior conjunction, and an *evening* star from superior to inferior conjunction The earth turns about her axis according to the order of the letters *mnvw*; when the spectator is at *n*, it is then night to him; and as, by the earth's rotation, he is carried towards *v*, it is manifest that the part *ace* of the orbit of venus will come into view before the sun *S* does; hence, if venus be any where in that part of her orbit, she will appear in the morning before sun-rise, and therefore she is then a *morning* star. As the spectator passes through *vwm*, it is day, and at *m* the sun will set; but the part *efa* of the orbit of venus will still be above his horizon, and therefore if venus be in that part, she will be visible after sun set, and will then be an *evening* star.

88. The orbits of *venus* and *mercury* are inclined to the orbit of the earth, and cut it at two opposite points, called the *nodes*, so that if we conceive the orbit of the earth to lie in the plane of the paper, the orbits of venus and mercury will lie, one half above the paper, and the other half below. It is upon this account that venus and mercury, when they come into their inferior conjunction, at *a*, do not always appear to pass over the sun's disc, or make a transit over it. If the nodes happen to lie in conjunction and opposition, then, when the planet comes into conjunction at *a*, it is in a line joining the earth and sun, and it will appear to pass over the disc of the sun, like a small, round, black spot. But if the nodes be at a certain distance from conjunction and opposition, when the planet comes into conjunction, it may be so far above or below the line joining the earth and sun, as not to pass over the sun. The transits of *venus* do not happen so often as those of *mercury*. The last transit of venus happened in 1769, and the next will be in 1874. The last transit of mercury happened in 1799, and the next will be in 1802.

89. When Dr. Halley was at St. *Helena*, whither he went for the purpose of making a catalogue of the southern stars, he observed a transit of mercury over the sun's disc, and this suggested to him a method of finding the sun's parallax from such observations, from the difference of the times of transit over the sun, at different places upon the earth's surface. But the difference of the

the times be[illegible] less for mercury than for venus, the conclusions will be more accurate for venus than for mercury. The doctor therefore proposed to determine the parallax of the sun from the transit of venus; and as it was not probable that he himself should live to observe the two next transits, which happened in 1761 and 1769, he very earnestly recommended the attention of them to the astronomers who might then be alive. Astronomers were therefore sent from *England* and *France* to the most proper parts of the earth, to observe both these transits; from which observations it appears, that the horizontal parallax of the sun at his mean distance, is $8\frac{7}{8}''$; hence, by article 14, sin. $8\frac{7}{8}''$: rad. :: rad. of earth : mean distance of the sun from the earth; now sin. $8\frac{7}{8}''$: rad :: 1 : 23575; therefore the mean distance of the sun from the earth is equal to 23575 semidiameters of the earth; and as we have determined (see art. 4 the radius of the earth to be 3965 miles, the mean distance of the earth from the sun = 23575 + 3965 = 93487[illegible] miles. For the method of finding the horizontal parallax, we refer the reader to the Treatise of Astronomy which we have before mentioned.

90. Having described the phænomena attending the inferior planets, we proceed to describe those which attend the superior.



91. Let S be the sun, E the earth, $EvKw$ the orbit of the earth, $IxVy$ the orbit of a superior planet, XY the sphere of the fixed stars; draw $VKSEIQ$, CaP, FbR, $mb\,P$; then when the planet is at I, it is in *opposition* to the sun, and at K, it is in *conjunction*. Now the earth moves faster than a superior planet; whilst the earth therefore moves from C to E, and from E to F, let the planet describe the smaller arcs aI, Ib. Then it is manifest, that when the earth is at C, the planet at a appears in the heavens at P; when the earth is at E, the planet at I appears at Q; and when the earth is at F, the planet at b appears at R; whilst therefore the earth moves from C to F, the planet appears to move from P to R, contrary to its real motion; hence, a superior planet is *retrograde* whilst it passes through *opposition*. Suppose now that when the earth is at K the planet is at I in conjunction with the sun, and let the earth move from K to m whilst the planet moves from I to b, then it will appear in the heavens to have moved from Q to P, or according to its real motion. Hence, a superior planet is *direct* when it passes through *conjunction*. As therefore a superior planet appears to move, sometimes direct and sometimes retrograde, it must appear stationary at the two points where the motion changes from one to the other.

92. When the planet is in opposition at I, or in conjunction at K, the earth being at E, it is manifest that the same face of the planet which is towards the sun, is also towards the earth, and therefore the planet appears full orbed; but if $nopq$ be the position of the planet, then the spectator on the earth at E will have a little of the dark part of the planet beyond n turned towards him, and therefore it will not be full orbed to the earth, but will appear like the moon a little before or after its full. But if the planet be at a very great distance from the sun, when compared with the earth's distance, there will be so little of the dark part turned towards the earth, that it will, as to sense, appear full orbed. Now this is the case with all the superior planets, except *mars*, which between conjunction and opposition is observed to appear not full orbed; but all the rest do, on account of their great distances.

93. It is found by observation, that the places of the aphelia of the orbits of the planets, and the places of their nodes, have a motion, and that the inclinations of their orbits to the ecliptic are subject to a variation. These circumstances arise from the mutual attractions of the planets.

94. It appears, from what we have already observed, that *mercury*, *venus*, and *mars* are opaque bodies, as they do not always shine with full faces, that part towards the earth which is not towards the sun, being dark. *Jupiter* and *saturn* cast shadows, and eclipse their satellites, and therefore they must be opaque bodies. The *georgian* has never been seen to eclipse its satellites, as the satellites have not, since the discovery of the planet, been in a situation to be eclipsed by the planet; but it being a body revolving about the sun, like the other planets, and having also satellites revolving about it, we may conclude by analogy, that it is an opaque body.

95. Kepler made three very important discoveries respecting

respecting the motion of the planets, and which are indeed the foundation of all astronomy.

1st. That the primary planets revolve about the sun in ellipses, having the sun in one of the foci. 2dly. That the squares of the periodic times of all the planets, have the same proportion to each other as the cubes of their respective mean distances. 3dly. That if a line be drawn from the sun to a planet, and move as the planet moves, it will describe about the sun, equal areas in equal times. These principles which KEPLER deduced from observation, SIR I. NEWTON proved to be true from the common principles of motion, and his theory of gravity.

96. The periodic time of the earth, or the time in which the earth makes a complete revolution in her orbit, called a *sidereal* revolution, is 365d. 6h. 9′. 11″,5. The time from the earth's leaving the first point of aries till she returns to it, is 365d. 5h, 48′. 48″, and this is called a *tropical* revolution; and this being less than her periodic time, it follows that the equinoctial points move backwards; and this motion is called the *precession of the equinoxes*. The time from the earth's leaving her apogee till she returns to it, is 365d. 6h. 14′. 2″; and this being greater than her periodic time, it follows that her apogee moves forward; this is called her *anomalistic* year.

97. The following table contains the relative *mean* distances of the planets from the sun, assuming the mean distance of the earth to be *unity*; together with their periodic times.

Planets	Mean Dist.	Periodic Times
Mercury	0,38710	87d. 23h. 15′. 43″,6
Venus	0,72333	224d. 16h. 49. 10,6
Earth	1,00000	365d. 6h. 9. 11,6
Mars	1,52369	1y. 321d. 23h. 30. 35,6
Jupiter	5,20279	11y. 315d. 14h. 27. 10,8
Saturn	9,54072	29y. 174d. 1h. 51. 11,2
Georgian	19,18352	83y. 150d. 18h.

98. A table of the places of the aphelia of the orbits for the beginning of 1750, with their motions in longitude in 100 years.

Planets.	Place of Aphelia	Mot. in 100 years
Mercury	8s. 13°. 33′. 58″	1°. 33′. 45″
Venus	10. 7. 46. 42	1. 21. 0
Earth	3. 8. 37. 16	1. 43. 35
Mars	5. 1. 28. 14	1. 51. 40
Jupiter	6. 10. 21. 4	1. 34. 33
Saturn	8. 28. 9. 7	1. 50. 7
Georgian	11. 16. 19. 30	1. 29. 2

99. A table of the places of the *ascending* nodes of the orbits of the planets for 1750, with their motions in longitude for 100 years.

Planets	Place of the Node	Mot. of Node
Mercury	1s. 15°. 20′. 43″	1°. 12′. 10″
Venus	2. 14. 26. 18	0. 51. 40
Mars	1. 17. 38. 38	0. 46. 40
Jupiter	3. 7. 55. 32	0. 59. 30
Saturn	3. 21. 32. 22	0. 55. 30

M. DE LA PLACE found the place of the node of the *Georgian* planet in 1788, to be 2°. 12′. 47″; but its motion is not yet determined.

100. A table of the inclinations of the orbits of the planets to the ecliptic for the year 1788; with the variation for 100 years.

Planets	Inclination	Variation
Mercury	7°. 0′. 0″	+20″ 43
Venus	3. 23. 35	+4,47
Mars	1. 51. 0	+3,45
Jupiter	1. 18. 56	−27,19
Saturn	2. 29. 50	−23,11
Georgian	0. 46. 20	

The variation is that arising from theory, as determined by M. DE LA GRANGE. The sign +, shows that the inclination increases, and the sign −, that it decreases

101. If two planets revolve in circular orbits, to find the time from conjunction to conjunction. Let P=the periodic time of a superior planet, p=the periodic time of an inferior planet, t=the time required. Then P : 1 day :: 360° : $\frac{360°}{P}$, the angle described by the superior planet in 1 day; for the same reason, $\frac{360°}{p}$ is the angle described by the inferior planet in 1 day; therefore $\frac{360°}{p}-\frac{360°}{P}$ is the daily angular velocity of the inferior planet *from* the superior, or how much the former recedes from the latter, every day. Now if they set out from conjunction, they will return into conjunction again, after the inferior planet has gained one revolution, or 360°; therefore $\frac{360°}{p}-\frac{360°}{P}$: 360° : 1 day : $t=\frac{Pp}{P-p}$. The rule therefore to find the required time, is *to multiply the periodic times together, and divide by their difference.* This will also give the time between two oppositions, or between any two similar situations. The time from conjunction to conjunction is called a *synodic* revolution.

On

On the Motion of the Moon, and its Phænomena.

102. The moon being the nearest, and, next to the sun, the most remarkable body in our system, and also useful for the division of time, it is no wonder that the ancient astronomers were attentive to discover its motions, and the orbit which it describes. The motion of the moon in its orbit about the earth, is from west to east, and its orbit is found to be inclined to the ecliptic. The motion of the moon is also observed not to be uniform, and its distance from the earth is found to vary, which shows that it does not revolve in a circle about the earth in its center; but its motion is found to be an ellipse, having the earth in one of the foci. The position of the ellipse is observed to be continually changing, the major axis not being fixed, but moving sometimes direct and sometimes retrograde; but, upon the whole, the motion is direct; and it makes a complete revolution in a little more than 8¾ years. The eccentricity of the ellipse is also found to change, that is, the ellipse is sometimes nearer to a circle than it is at other times. The inclination of its orbit is found likewise subject to a variation from 5° to 5°. 18′. All these irregularities arise from the sun disturbing the moon's motion by its attraction.

103. As the ellipse which the moon describes about the sun, is subject to a variation, the periodic time of the moon about the earth will also vary: in winter, the moon's orbit is dilated, and the periodic time is increased; and in summer, her orbit is contracted, and her periodic time is diminished. The periodic time of the moon increases whilst the sun is moving from his apogee to his perigee, and decreases whilst he moves from his perigee to his apogee; and the greatest difference of the periodic times is found to be about 22½ minutes.

104. The *mean* periodic time of the moon is 27d. 7h 43′. 11″,5; this is called her sidereal revolution, being the *mean* time from her leaving any fixed star, till her return to it again. Now it is found by observation, that the *mean* time from her leaving her apogee till she returns to it, is 27d. 13h. 18′. 4″; hence, the moon is longer in returning to her apogee than she is in making a revolution in her orbit, and therefore her apogee must move forward. The *mean* time from her leaving her node till she returns to it again, is 27d. 5h. 5′. 35″,6; and this being less than her *mean* periodic time, it follows that she returns to her node before she has completed her revolution, and therefore her nodes must have a retrograde motion.

105. The time between two *mean* conjunctions of the sun and moon, or from new moon to new moon, supposing their motions had both been uniform, is found by the rule in article 101; taking therefore the mean periodic time of the moon and sun as already stated, we get the *mean* time from conjunction to conjunction to be 29d. 12h. 44′. 2″,8, and this is called her *synodic* revolution. The *true* time from new to new moon will be sometimes greater and sometimes less than this. The causes of all these irregularities we will briefly explain.

106. The apparent diameter of the moon is found continually to vary; now the apparent diameter of any very distant body, varies inversely as its distance. Hence, as the apparent diameter of the moon increases, she must approach the earth; and when it decreases, she must recede from the earth. This variation of her apparent diameter agrees exactly with what ought to be the case, if the moon moved in an ellipse about the earth in one of its foci; we conclude therefore that the moon moves in an ellipse about the earth situated in one of its foci, as no other supposition will agree with the observed variation of the moon's diameter. From the variation of the sun's diameter, it appears in like manner, that the earth must revolve in an ellipse about the sun, having the sun in one of the foci.

107. The earth moving in an ellipse about the sun in its focus, the nearer the earth comes to the sun, the more it is attracted by him, and this attraction increases in the same ratio as the square of the distance diminishes; and on the contrary, it decreases as the square of the distance increases. As therefore the earth approaches the sun all the time it moves from the aphelion to the perihelion, the attraction increases, and conspiring partly with the earth's motion, it accelerates the motion of the earth; and when the earth moves from perihelion to aphelion, the attraction acts partly against the earth's motion, and diminishes its motion. Thus, the velocity of the earth increases whilst it moves from the aphelion to perihelion, and decreases as much whilst it moves from perihelion to aphelion. As the moon moves in an ellipse about the earth in its focus, she must, in like manner by the earth's attraction, have her velocity increased from her apogee to perigee, and decreased as much from her perigee to apogee. These are the principal causes of the variation of the velocities of the earth and moon. But as the sun attracts the moon, as well as the earth attracts it, the attraction of the sun will cause another variation of the moon's velocity. Thus the moon being attracted both by the sun and earth, they will cause great irregularies in her motion; and hence it is very difficult to compute the place of the moon. After finding the *mean* place of the moon, that is, the place where she would have been if her motion had been uniform, it requires not less than 20 corrections, in order to get the true place to a sufficient degree of accuracy. Sir I. Newton was the first person who pointed out the sources of these irregularities; but they are of a nature too difficult to admit of a popular illustration.

108. When we view the moon with a telescope, we find that her surface is very rough with mountains and cavities; this appears from the very jagged boundary of the light and dark parts. Also, certain parts are found to project shadows always opposite to the sun; and when the sun becomes vertical to any of them, they are observed to have no shadow; these therefore must be mountains. Other parts are always dark on that side next the sun, and illuminated on the opposite side; these therefore must be cavities. Hence, the appearance of the moon constantly varies, from its altering its situation in respect to the sun. The tops of the mountains on the

dark part of the moon, are frequently seen enlightened at a distance from the confines of the illuminated part. The dark parts have, by some, been thought seas; and by others, to be only a great number of caverns and pits, the dark sides of which next to the sun, would cause those places to appear darker than the rest. The great irregularity of the line bounding the light and dark parts, on every point of the surface, proves that there can be no very large tracts of water, as such a regular surface would necessarily produce a line, terminating the bright part, perfectly free from all irregularity. Also, if there was much water upon its surface, and an atmosphere, as conjectured by some astronomers, the clouds and vapours might easily be discovered by our telescopes; but no such phænomena have ever been observed.

109. On April 9, 1787, Dr. Herschel discovered three volcanoes in the dark part of the moon; two of them seemed to be almost extinct, but the third showed an actual eruption of fire, or luminous matter, resembling a small piece of burning charcoal covered by a thin coat of white ashes; it had a degree of brightness about it, as strong as that with which such a coal would be seen to glow in faint day light. The adjacent parts of the volcanic mountain seemed faintly illuminated by the eruption. A similar eruption appeared on May 4, 1783. On March 7, 1794, a few minutes before 8 o'clock in the evening, Mr. Wilkins of Norwich, an eminent architect, observed, with the naked eye, a very bright spot upon the dark part of the moon; it was there when he first looked at the moon; and the whole time he saw it, which was about 5 minutes, it was a fixed, steady light, except the moment before it disappeared, when its brightness increased. The same phænomenon was also observed by Ma. T. Stretton, in St. John's-square, Clerkenwell, *London*. On April 13, 1793, M. Piazzi, Astronomer-Royal, at *Palermo*, observed a bright spot on the dark part of the moon; and several other astronomers have observed the same phænomenon.

110. It has been a doubt amongst astronomers, whether the moon has any atmosphere; some suspecting that at an occultation of a fixed star by the moon, the star did not vanish suddenly, but lost its light gradually, and thence concluded, that the moon has an atmosphere. M. Schroeter of *Lilienthan*, in the *Duchy of Bremen*, has endeavoured to establish the existence of an atmosphere, from the following observations. 1. He observed the moon when $2\frac{1}{4}$ days old, in the evening soon after sun set, before the dark part was visible; and continued to observe it till it became visible. Two cusps appeared tapering in a very sharp, faint, prolongation, each exhibiting its farthest extremity faintly illuminated by the solar rays, before any part of the dark hemisphere was visible; soon after, the whole dark limb appeared illuminated. This prolongation of the cusps beyond the semicircle, he thinks most arise from the sun's rays being refracted by the moon's atmosphere. He computes also the height of the atmosphere, which refracts light enough into the dark hemisphere to produce a twilight, more luminous than the light reflected from the earth when the moon is about 32° from the new, to be 1356 Paris feet; and that the greatest height capable of reflecting the solar rays is 5376 feet. 2dly. At an occultation of *jupiter's* satellites, the third disappeared, after having been 1″ or 2″ of time indistinct; the fourth became indiscernible near the limb; this was not observed of the other two. See the *Phil. Transf.* 1792.

111. Many astronomers have given maps of the moon; but the most celebrated are those of Hevelius in his *Selenographia*; in which he has represented the appearance of the moon in its different states from the new to the full, and from the full to the new; these figures Mayer prefers. Langrenus and Ricciolus denoted the spots upon the surface, by the names of philosophers, mathematicians, and other celebrated men; giving the names of the most celebrated characters, to the largest spots. Hevelius marked them with the geographical names of places upon the earth. The former distinction is now generally used.

112. Very nearly the same face of the moon is always turned towards the earth, it being subject to only a small change within certain limits, those spots which lie near the edge appearing and disappearing by turns; this is called its *Libration*. The moon turns about its axis in the same direction in which it revolves in its orbit. Now the angular velocity about its axis is uniform, and it turns about its axis in the same time in which it makes a complete revolution in its orbit; if therefore the angular motion about the earth were also uniform, the same face of the moon would always be turned towards the earth. For if the moon had no rotation on her axis, when she is on opposite sides of the earth she would show different faces; but if, after she has made half a revolution in her orbit, she has also turned half round her axis, then the face, which would otherwise have been shown, will be turned behind, and the same face will appear. And thus if the moon's angular velocity about her axis were always equal to her angular velocity in her orbit about the earth, the same side of the moon would be always towards the earth. But as the moon's angular velocity about her axis is uniform, and her angular velocity in her orbit is not uniform, their angular velocities cannot continue always equal, and therefore the moon will sometimes show a little more of her eastern parts, and sometimes a little more of her western parts; this is called a libration in *longitude*. Also, the moon's axis is not perpendicular to the plane of her orbit, and therefore at opposite points of her orbit, her opposite poles are turned towards the earth: therefore her poles appear and disappear, by turns; this is called a libration in *latitude*.

113. Hence, nearly one half of the moon is never visible at the earth, and therefore nearly one half of its inhabitants (if it have any) never saw the earth, and nearly the other half never lose sight of it. Also, the time of its rotation about its axis being a month, the length of the lunar days and nights will be about a fortnight each.

114. It is a very extraordinary circumstance, that the time of the moon's revolution about her axis should be equal to that in her orbit. Sir I. Newton, from the

the altitude of the tides upon the earth, has computed the altitude of the tides on the moon's surface to be 93 feet, and therefore the diameter of the moon perpendicular to a line joining the earth and moon, is less than the diameter directed to the earth by 186 feet. Hence, says he, the same face must always be towards the earth, except a small oscillation; for if the longest diameter should get a little out of that direction, it would be brought into it again by the earth's attraction. The supposition of D. DE MAIRAN is, that the hemisphere of the moon next the earth is more dense than the opposite one, and hence, the same face would be kept towards the earth, upon the same principle as before.

115. When the moon is in conjunction with the sun, she is then said to be *new*, and her dark side being next to the earth, she is then invisible. As she recedes from the sun, we first discover some of her bright part, and she appears *horned* till she gets 90° from the sun, when she appears half enlightened, or *dichotomised*; from thence, till she comes into opposition, she appears above half enlightened, or *gibbous*; and at opposition she appears full orbed, the same face being then turned towards the earth which is towards the sun, and she is then said to be at her *full*. And from opposition to conjunction, her apparent bright part decreases as it before increased.

116. When the moon is about three days from the new, the dark part is very visible, by the light reflected from the earth, which is moon-light to the lunarians, considering our earth as a moon to them; and in the most favourable state, some of the spots may be then seen. But when the moon gets into quadratures, its great light prevents the dark part from being seen. According to DR SMITH, the strength of moon-light at the full moon, is 90 thousand times less than the light of the sun; but from experiments made by M. BOUGUER, he concluded it to be 300 thousand times less. The light of the moon condensed by the best mirrors, produces no sensible effect upon the thermometer. Our earth, in the course of a month, shows the same phases to the lunarians, as the moon does to us; the earth is at the full, at the time of the new moon, and at new, at the time of the full moon. The surface of the earth being about 13 times greater than that of the moon, it affords 13 times more light to the moon, than the moon does to us.

117. DR. HERSCHEL has measured the height of a great many of the lunar mountains, and finds that, a few excepted, they generally do not much exceed half a mile. Before he measured them, they were reckoned much higher, being generally overrated. He observes, that it should be examined whether the mountain stands on level ground, which is necessary, that the measurement may be exact.

118. As the spectator is carried by the earth's rotation, his horizon will continually change its situation, and therefore it will continually cut the moon's orbit at different points till it has gone through the whole orbit; and the inclination of the orbit to the horizon will be continually changed. Now the difference between the times of the rising of the moon on two successive nights, will depend upon the angle which the moon's orbit makes with the horizon; the less the angle is, the less the moon will have descended below the horizon, at the time when the horizon is brought into the same situation it was 24 hours before; therefore when the angle which the m. ' orbit makes with the horizon is the least, there wi.. . the least difference of the times of her rising. Now, that angle is the least, when the first point of aries rises, at which time, in the latitude of *London*, there is only about 17 minutes difference of the moon's rising on two successive nights. Now, about the 22d of September, the first point of aries rises at the time the moon rises, if the moon be then at the full, because it will then be at the beginning of aries. In this case, therefore, the moon will rise about the full for several nights, with but a small difference of the times of her rising. This happening in the time of harvest, it is called the *harvest* moon. As the full moon may not happen on the 22d of September, that which happens nearest to it, is called the harvest moon. The same small difference of the times of rising of the moon, happens every month, but it not happening at the full moon, and at that time of the year, it is not taken notice of. The greatest difference of the times of the moon's rising at *London* on two successive nights, is about 1 hour and 17 minutes; and this happens when the moon is in the first point of libra, and therefore it happens at the *vernal* full moons.

119. There is a phænomenon called the *horizontal moon*, which is this, that it appears larger in the horizon than in the meridian; whereas from its being farther from us in the former case than in the latter, it subtends a less angle when in the horizon. It is perhaps not easy to give a satisfactory answer to this deception. GASSENDUS thought that, as the moon was less bright in the horizon than in the meridian, we looked at it, in the former situation, with a greater pupil of the eye, and therefore it appeared larger. But this is not agreeable to the principles of optics, since the magnitude of the image upon the retina of the eye, does not depend upon the size of the pupil. DES CARTES thought that the moon appeared largest in the horizon, because, when, comparing its distance with the intermediate objects, it appeared then farthest off; and as we judge its distance greater in that situation, we, of course, think it larger, supposing that it subtends the same angle. DR. BERKLEY accounts for it thus: Faintness suggests the idea of greater distance; the moon appearing faintest in the horizon, suggests the idea of greater distance; and, supposing the angle the same, that must suggest the idea of a greater *tangible* object. He does not suppose the *visible* extension to be greater, but that the idea of a greater *tangible* extension is suggested, by the alteration of the visible extension. He says, - 1st, That which suggests the idea of greater magnitude, must be something perceived; for that which is not perceived can produce no effect. 2dly, It must be something which is variable, because the moon does not always appear of the

the ſame magnitude in the horizon. 3dly, It cannot lie in the intermediate objects, they remaining the ſame; alſo, when theſe objects are excluded from ſight, it makes no alteration. 4thly, It cannot be the viſible magnitude, becauſe that is leaſt in the horizon. The cauſe therefore muſt lie in the viſible appearance, which proceeds from the greater paucity of rays coming to the eye, producing *faintneſs*. Mr. Rowning ſuppoſes that the moon appears farthest from us in the horizon, becauſe the portion of the ſky which we ſee, appears not an entire hemiſphere, but only a portion of one; and hence we judge the moon to be further from us in the horizon, and therefore larger. Dr. Smith, in his *Optics*, gives the ſame reaſon. The ſame circumſtances take place in the ſun. Alſo, if we take two ſtars near each other in the horizon, and two other ſtars near the zenith at the ſame angular diſtance, the two former will appear at a much greater diſtance from each other, than the two latter. On this account, people are, in general, much deceived in eſtimating the altitudes of the heavenly bodies above the horizon, judging them to be much greater than they are. The lower part of a rainbow alſo appears much wider than the upper part; and this may be conſidered as an argument that the phænomenon cannot depend entirely upon the greater degree of faintneſs of the object when in the horizon, becauſe the lower part of the bow frequently appears brighter than the upper part, at the ſame time that it appears broader. Alſo, faintneſs can have no effect upon the angular diſtance of the ſtars; and as the difference of the apparent diſtance of the two ſtars, whoſe angular diſtance is the ſame in the horizon and the zenith, ſeems to be fully ſufficient to account for the apparent variation of the moon's diameter in theſe ſituations, it may be doubtful whether the faintneſs of the object enters into any part of the cauſe.

120. The *mean* diſtance of the moon from the earth is about 239 thouſand miles, and her ſemidiameter is nearly $\frac{1}{4}$ of the radius of the earth, or about 1081 miles. And as the magnitudes of ſpherical bodies are as the cubes of their radii, the magnitude of the moon : magnitude of the earth : : $3^3 : 11^3$: : 1 : 49 nearly.

On the Rotation of the Sun and Planets.

121. The times of rotation of the ſun and planets are determined by the ſpots which are obſerved upon their ſurfaces; either by finding the arc which is deſcribed in a given time by a ſpot, or by obſerving how long it is in paſſing over the whole diſc.

On the Rotation of the Sun.

122. It is doubtful by whom the ſpots on the ſun were firſt diſcovered. Scheiner obſerved them in May, 1611, and publiſhed an account of them in 1612. Galileo, in a publication in 1613, ſays, that being at *Rome*, in April 1611, he then ſhowed the ſpots on the ſun to ſeveral people, and that he had ſpoken of them ſome months before, to his friends at *Florence*. He imagined them to adhere to the ſun. Kepler ſays, they were obſerved by a ſon of David Fabricius, who publiſhed an account of them in 1611. In the papers of Harriot, not yet publiſhed, it is ſaid that ſpots upon the ſun were obſerved in *December*, 1610. From obſerving the motion of the ſpots, the time of the ſun's rotation is determined to be 25d. 14h. 5′

123. Beſides the dark ſpots upon the ſun, there are alſo parts of the ſun called *faculæ*, *lucili*, &c. which are brighter than the general ſurface; theſe abound moſt in the neighbourhood of ſpots, or where ſpots have lately been. Moſt of the ſpots appear within 30° of the ſun's equator. On April 19, 1779, Dr. Herſchel ſaw a ſpot whoſe diameter was 1′. 8″, which is equal in length to more than 31 thouſand miles; this was viſible to the naked eye.

On the Rotation of the Planets.

124. The *georgian* is at ſo great a diſtance, that aſtronomers have not been able to determine, whether it has any rotation about its axis.

125. *Saturn* was ſuſpected by Caſſini and Fato, in 1683, to have a revolution about its axis; for they one day ſaw a bright ſtreak, which diſappeared the next, when another came into view near its diſc. Theſe ſtreaks are called *belts*. In 1719, when the ring diſappeared, Caſſini ſaw its ſhadow upon the planet, and a belt on each ſide parallel to the ſhadow. Dr. Herſchel found that the arrangement of the belts always followed that of the ring. And during his obſervations on June 19, 20, and 21, 1780, he ſaw the ſame ſpot in three different ſituations; from all which he concluded that Saturn revolved about an axis which is perpendicular to the plane of the ring. Another argument in ſupport of its rotation, is, that the planet is an oblate ſpheroid, having the diameter in the direction of the ring, to the diameter perpendicular to it, as 11 to 10, according to the Doctor. The truth of this conjecture he afterwards verified, having determined that Saturn revolves about its axis in 10h 16′.

126. *Jupiter* is obſerved to have belts, and alſo ſpots, by which the time of its rotation has been determined. From a ſpot which Caſſini obſerved in 1665, he found the time of rotation to be 9h 56′. From other ſpots in October 1691, he found the time 9h. 5 ′; and from other ſpots he determined the time to be 9h. 50′; and, in general, he found that the nearer the ſpots were to the equator, the quicker they revolved; from whence it is probable that the ſpots are not upon the body of Jupiter, but in its atmoſphere. Dr. Herſchel alſo found the time of rotation to vary, from different ſpots; and that the time of revolution of the ſame ſpot diminiſhed; and obſerves, that ſuch a circumſtance is agreeable to the theory of equinoctial winds, as it may be ſome time before the ſpot can acquire the velocity of the wind. Dr. Pound made the polar to the equatorial diameter as 12 : 13. Dr. Bradley made them as 12,5 : 13,5. Sir Isaac Newton made them as $9\frac{1}{4}$: $10\frac{1}{4}$ by

10¼ by theory. The belts of jupiter are generally parallel to his equator, and are subject to great variations, both in respect to their number and figure; from which it is probable that they exist in the atmosphere.

127. Galileo discovered the phases of *mars*; after which some *Italians* saw a spot in 1636. But in 1666, Dr. Hook and M. Cassini discovered some well defined spots, and the latter determined the time of rotation to be 24h. 40′. Maraldi made it 24h. 39′; and discovered a very bright part near the southern pole; but the brightness is subject to some change. Something like this has been seen about the north pole. Dr. Herschel makes the time of rotation to be 24h 39′. 21″,67. He also concludes, that mars has a considerable atmosphere.

128. Galileo first discovered the phases of *venus*, in 1611. In 1666, Cassini, at the time when venus was dichotomised, discovered a bright spot upon it, at its straight edge, and by observing its motion, he found the time of rotation to be 23h. 16′. M. Shroeter has endeavoured to show that venus has an atmosphere, from observing that the illuminated limb, when horned, exceeds a semicircle, as in the case of the moon; the cuspa sometimes ran 15°. 19′ into the dark hemisphere. He makes the time of rotation 23h. 21′; and concludes from his observations, that there are very high mountains upon the surface.

129. The phases of *mercury* are easily distinguished, but no spots have yet been discovered, by which it can be ascertained whether it has any rotation.

On the Rotation of the Satellites.

130. The *fifth* satellite of *saturn* was observed by M. Cassini for several years as it went through the eastern part of its orbit, to appear less and less till it became invisible; and in the western part, to increase again. These phænomena can hardly be accounted for, but by supposing some parts of the surface to be incapable of reflecting light, and therefore when such parts are turned towards the earth, they appear to grow less, or to disappear. And as the same circumstances always returned again when the satellite returned to the same part of its orbit, it affords a strong argument that the time of the rotation about its axis, is equal to the time of its revolution about its primary, a circumstance similar to the case of the moon. Dr Herschel has discovered that all the satellites of *jupiter* have a rotation about their axis, of the same duration as their respective periodic times about their primary.

On the Satellites of Jupiter.

131. On January 8, 1610, Galileo discovered the four satellites of jupiter, and called them *Medicean stars*, in honour of the family of the *Medici*, his patrons. This was a discovery of great importance, as it furnished a ready method of finding the longitude of places upon the earth's surface, by means of their eclipses. The eclipses led M. Roemer to the discovery of the progressive motion of light; and hence Dr. Bradley was enabled to solve an apparent motion of the fixed stars, which could not otherwise have been accounted for.

132. The satellites of jupiter in going from west to east are eclipsed by the shadow of jupiter, and as they go from east to west, they are observed to pass over its disc. Hence, they revolve about jupiter. The three first * satellites are always eclipsed when they are in opposition to the sun, and the length of their eclipses is found to vary; but sometimes the fourth satellite passes through opposition without being eclipsed. Hence it appears, that the planes of their orbits do not coincide with the plane of jupiter's orbit; for in that case, they would always pass through the centre of his shadow, and be always equally eclipsed at every opposition. The periodic times are as follows:

First	Second	Third	Fourth
1d. 18h. 27′. 33″	3d. 13h. 13′. 42″	7d. 3h. 42′. 33″	16d. 16h. 32′ 8″

133. The distances of the satellites from jupiter, in terms of the semidiameter of jupiter, are as follows:

First	Second	Third	Fourth
5,965	9,494	15,141	26,63

134. The periodic times and distances of these satellites observe the same law as those of the primaries respecting the sun; that is, the squares of the periodic times have the same proportion to each other, as the cubes of their respective distances.

135. A satellite is sometimes hidden behind the body of jupiter without entering into its shadow; and this is called an *occultation*.

On the Satellites of Saturn.

136. In the year 1665, Huygens discovered the

* The first satellite is that nearest to the planet, and the others in their order from it.

fourth satellite of saturn. In 1671, CASSINI discovered the fifth; in 1672, he discovered the third; and in 1684, he discovered the first and second. DR. HERSCHEL has discovered a sixth and seventh satellite, which lie within the orbits of the other five. The planes of the orbits of them all, except the fifth in order from the planet, coincide very nearly with the plane of the ring of the planet. DR. HALLEY found that the orbit of the fourth (at that time discovered) was elliptical. The periodic times are as follows:

First	Second	Third	Fourth	Fifth	Sixth	Seventh
22h. 37′. 23″.	1d. 8h. 53′. 9.	1d. 21h. 18′. 27″.	2d. 17h. 41′. 22″.	4d. 3h. 25. 12″.	15d. 22h. 41. 12″.	79d. 7h. 49.

137. Their distances from Saturn, in terms of minutes and seconds of a degree, are as follows:

First	Second	Third	Fourth	Fifth	Sixth	Seventh
28″,7	36″,8	43″,5	56″	1′. 18″	3′ 0″	8′. 42″.5

138. The periodic times and distances observe the same law as those of jupiter; see art. 134.

On the Satellites of the Georgian.

139. In 1787, DR. HERSCHEL, the discoverer of the *georgian*, discovered two satellites belonging to it; and he determined the synodic revolution of one of them to be 8d. 17h. 1′ 19,″3, and of the other 13d. 11h. 5′. 1″,5; also the distance of the former from the planet in minutes and seconds of a degree, was found to be 33″,09. and of the latter 44″,23. And since these discoveries were made, the Doctor has discovered four more satellites; and found that the motions of them all are retrograde. Their orbits are nearly perpendicular to the plane of the ecliptic.

On the Ring of Saturn.

140. GALILEO was the first person who observed any thing extraordinary in *Saturn*. That planet appeared to him like a large globe between two small ones. In 1610 he announced this discovery; and continued his observations till 1612, when he was surprised to find only the middle globe. But afterwards he again discovered the globes on each side, which in process of time, appeared to change their form. Upon this, HUYGENS set about improving the art of grinding object glasses; and made telescopes which magnified, two or three times more than any which had been before made, with which he discovered the ring of saturn; and having observed it for some time, he published the discovery in 1656. The ring is broad and flat, at a distance from the planet, and edge-ways towards it. In 1675, CASSINI, observed a dark line upon the ring, dividing it, as it were, into two rings, the inner of which appeared brighter than the outer. He also observed a dark belt upon the planet, parallel to the major axis of the ring; for though the ring is circular, yet, being seen obliquely, it appears an ellipse. DR. HERSCHEL observes, that the black mark on the ring, is not in the middle of its breadth. The ring is no less solid than the planet, and it is generally brighter than the planet. He takes notice of the extreme thinness of the ring, as he saw a satellite on edge, hanging over on each side.

141. The ring is invisible when its plane passes through the earth, the sun, or between them. In the first case, the sun shines only on its edge, which is too thin to reflect light enough to render it visible; in the second case, the edge only being exposed to us, it is invisible for the same reason; in the third case, the dark side is towards us. DR. HERSCHEL suspects that the ring is divided into two rings, for the following reasons: 1st, The black divisions on the two sides, are exactly in the same situations. 2dly, The division on the ring, and the open space between the ring and the body, appear equally dark, and of the same colour as the heavens about the planet. Hence, he concludes, that saturn has two concentric rings, situated in one plane, the dimensions of which are in the following proportions:

	Parts
Inside diameter of the smaller ring -	5900
Outside diameter - - -	7510
Inside diameter of the larger ring -	7740
Outside diameter - -	8300
Breadth of the inner ring - -	805
Breadth of the outer ring - -	280
Breadth of the space between the rings -	115

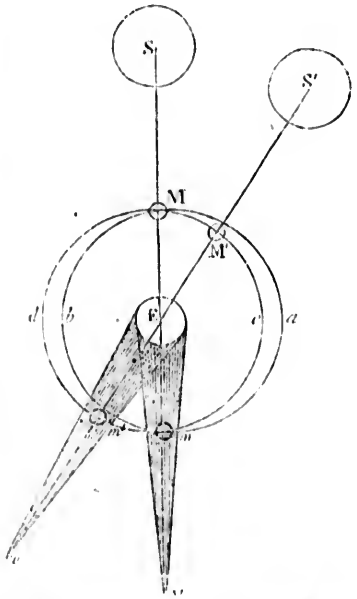
From the mean of a great many measures of the outside diameter of the larger ring, DR. HERSCHEL makes it 46″,677 at the mean distance of saturn; and hence, he finds the diameter of the ring to be 204883 miles; and the distance of the two rings 2839 miles.

On Eclipses of the Sun and Moon.

142. An eclipse of the *moon* is caused by its entering into the earth's shadow, and consequently it must happen at the *full* moon, or when she is in opposition to the sun, as the shadow of the earth must lie opposite to the sun. An eclipse of the *sun* is caused by the interposition of

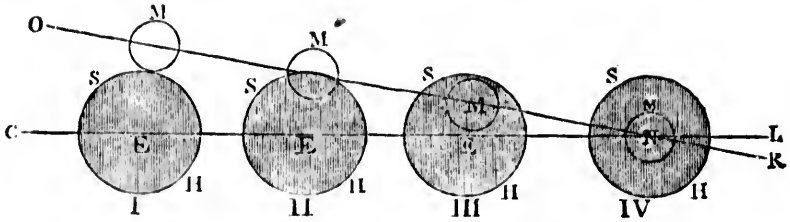
the moon between the earth and sun, and therefore it must happen when the moon is in conjunction with the sun, or at the *new* moon.

143. If the plane of the moon's orbit coincided with the plane of the ecliptic, there would be an eclipse at every conjunction and opposition; but the plane of the moon's orbit being inclined to the plane of the ecliptic, there can be no eclipse at conjunction or opposition, unless at that time the moon be at, or near the node.



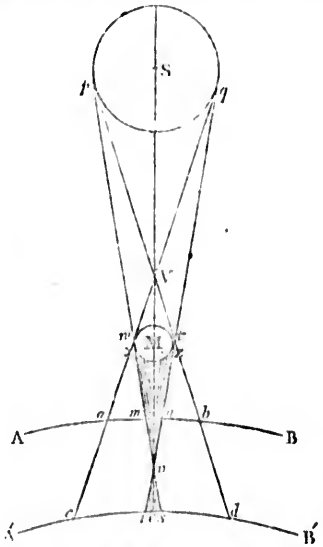
For let S, S' represent the sun in two different situations, E the earth, and let the plane of the paper represent the plane in which the earth moves round the sun, or the ecliptic; and let *Mcmd* represent the moon's orbit, inclined to the ecliptic, and cutting it in two points M, m, in the line SEV, then MEm is the line of the nodes, lying in conjunction and opposition, the sun being at S; and we must conceive half the orbit *Mcm* to lie above the paper, and the other half *mdM* to lie below it; describe also the circle *Mamb* on the paper; then these two circles *Mcmd*, *Mamb*, will be inclined to each other, like two hoops put one into the other, and inclined one to the other. Now if the moon be at M in conjunction with the sun S, the three bodies are then in the same plane, and in the same straight line, and therefore the moon is interposed between the sun and earth, and causes an eclipse of the sun. But if the sun be at S' and the moon in conjunction at M', she is then *out* of the plane of the ecliptic, the part M' lying *above* the plane of the paper, or the ecliptic, and therefore the moon is not in the line joining S' and E; and M' may be so far from the node at M, that it may be so much elevated above the plane of the ecliptic, as not to interpose between S' and E, in which case there can be no eclipse of the sun. Whether therefore there will be an eclipse, or not, at conjunction, depends upon how far the moon at M' is distant from the node at M, at the time of conjunction. If the moon be at the node m at the time of opposition, the three bodies are then in the same straight line, and the moon must pass through the center of the earth's shadow, and be totally eclipsed. But if at the time of opposition to the sun at S', the moon be at m', m' may be so far below the shadow Ev of the earth, that the moon may not pass through it, in which case there will be no eclipse. Whether therefore there will be a lunar eclipse at the moon's opposition, or not, depends upon how far the moon at m is distant from the node at m, at that time. But if the plane *Mcmd* of the moon's orbit coincided with the plane of the ecliptic, or the plane of the paper, there would manifestly be a central interposition every conjunction and opposition, and consequently an eclipse. It is also evident, that the place of the earth seen from the sun is the same as the place of the earth's shadow, they both lying in the same line from the sun.

144. The



144. The different eclipses which may happen of the moon, may be thus explained. Let *CL* represent the plane of the ecliptic, *OR* the moon's orbit, cutting the ecliptic in the node *N*; and let *SH* represent a section of the earth's shadow at the distance of the moon from the earth, and *M* the moon at the time when it is in opposition to the sun; for as the earth's shadow is always opposite to the sun, when the moon passes by, or through the shadow, she must be in opposition. Hence, if the opposition happen as in position I, it is clear that the moon will just pass by the shadow of the earth without entering it, and there will be no eclipse. In position II, part of the moon will pass through the earth's shadow, and there will be a *partial* eclipse. In position III, the whole of the moon passes through the earth's shadow, and there is a *total* eclipse. In position IV, the center of the moon passes through the center of the earth's shadow, and there is a *total* and *central* eclipse. It is plain therefore, that whether there will, or will not be an eclipse at the time of opposition, depends upon the distance of the moon from the node at that time, or the distance of the earth's shadow from the node. Now it appears by calculation, that if *EN* be greater than 11°. 34′ at the time of opposition, there can be no eclipse; and when *EN* is less than that quantity, there may be an eclipse. The distance *EN* (=11°. 34′.) in position I, is called the *ecliptic limit* of a lunar eclipse. Or as (by the last article) the place of the earth's shadow is the same as the place of the earth seen from the sun, it is manifest, that if at the time of opposition we compute the place of the earth, and find it to be less than 11°. 34′, from the node, we know that there may be an eclipse; and then we may proceed to the calculation; but for that, we must refer the reader to the Treatise before mentioned, as we can here only explain the general principles.

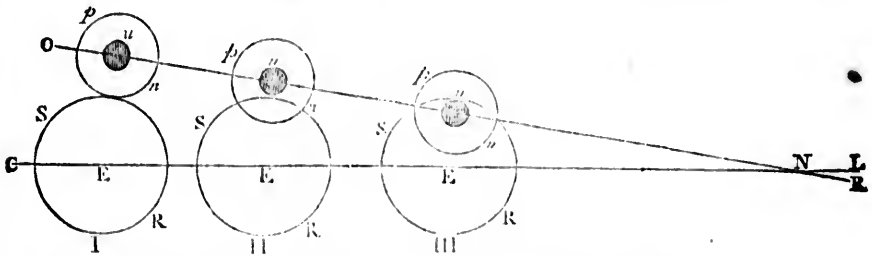
145. The phænomena of a solar eclipse, may be thus explained.



Let *S* be the sun, *M* the moon, *AB*, or *A′B′*, part of the surface of the earth, for at different times, the earth is at different distances from the moon; draw tangents *pnvs*, *qzvr*, from the sun to the *same* side of the moon, and

and *xvz* will be the moon's *umbra*, in which no part of the sun can be seen; and if tangents *ptbd*, *qwac*, be drawn from the sun to the *opposite* sides of the earth, the space comprehended between the umbra, and *qvac*, *tbd*, is called the *penumbra*, in which only a part of the sun can be seen. Now it is manifest, that if *AB* be the surface of the earth, the space *mn*, where the umbra falls, will suffer a *total* eclipse; the parts *am*, *bn*, between the boundaries of the umbra and penumbra, will suffer a *partial* eclipse; but to all the other parts of the earth there will be no eclipse, no part of the sun being there hidden by the moon. Now let *A'B'* be the surface of the earth; then the space *rs* will suffer an *annular* and *partial* eclipse, the sun appearing all round the moon, in the form of a ring; the parts *cr*, *ds*, will suffer a *partial* eclipse; and the other parts of the earth will suffer no eclipse. In this situation of the earth, there can therefore be no total eclipse anywhere.

146. The umbra *xvz* is a cone, whose vertex is *v*; and the penumbra *wcdt* is the frustrum of a cone, whose vertex is *V*. Hence, if these be both cut through their common axis, and perpendicular to it, the section of each will be a circle, having a common center in the axis, which is the line joining the centers of the sun and moon; and the section of the penumbra includes that of the umbra.



147. The different eclipses which may happen of the *sun*, may be thus explained. Let *CL* represent the orbit of the earth; *OR* the line described by the centers of the moon's umbra and penumbra at the earth; *N* the moon's node; *SR* the earth; *pn* the moon's penumbra, and *u* the umbra. Then in position I, the penumbra just passes by the earth, without falling upon it, and therefore there will be no eclipse. In position II, the penumbra falls upon the earth, but the umbra does not, therefore there will be a *partial* eclipse where the penumbra passes over, but no total eclipse. In position III, both the penumbra and umbra fall upon the earth; therefore where the umbra passes over, there will be a *total* eclipse; where the penumbra only passes over, there will be a *partial* eclipse; and to the other parts of the earth there will be no eclipse. It is manifest therefore that whether there will be an eclipse, or not, or whether it will be partial or total, depends upon the earth's distance from the node, at the time of conjunction. Now it appears by calculation, that, if at conjunction, *EN* be greater than 17°. 21′, there can be no eclipse, but if it be less, there may be one. The distance *EN* (=17°. 21′) in position I, is called the *ecliptic limit* of a solar eclipse.

148. The ecliptic limits of the sun are to those of the moon as 17°. 21′ to 11°. 34′, or nearly as 3 to 2, and hence there will be more solar than lunar eclipses, in about that ratio. But more lunar than solar eclipses are seen at any given place, because a lunar eclipse is visible to a whole hemisphere of the earth at once; whereas a solar eclipse is visible to a part only, and therefore there is a greater probability of seeing a lunar than a solar eclipse. Since the moon is as long above the horizon as below, every spectator may expect to see half the number of lunar eclipses which happen.

149. If the earth had no atmosphere, when the moon was totally eclipsed she would be invisible; but by the refraction of the atmosphere, some rays will be brought to fall on the moon's surface, on which account the moon is rendered visible, and of a dusky red colour.

150. An eclipse of the *moon* arising from a real deprivation of light, must appear to begin at the same instant of time to every place on that hemisphere of the earth which is next the moon. Hence, it affords a ready method of finding the longitudes of places upon the earth's surface, as will be afterwards explained.

151. The diameters of the sun and moon are supposed to be divided into 12 equal parts, called *digits*, and an eclipse is said to be so many digits, according to the number of those parts which are involved at the greatest darkness.

152. The greatest number of eclipses which can happen in a year is seven, and when this happens, five will be of the sun and two of the moon. The least number which can happen is two, and these must be both solar; for in every year there must be two solar eclipses. The mean number in a year is about four.

153. In a total eclipse of the sun, the planets, and some of the brightest of the fixed stars, have been seen.

154. There are two seasons in the year when eclipses happen,

happen, that is, when the earth approaches near each node, as before shown; and as the nodes lie at opposite points of the earth's orbit, these seasons would be at the distance of half a year from each other, if the nodes were stationary; but as the nodes have a retrograde motion of about 19° in a year, and the earth moves about a degree in a day, the seasons of eclipses will return at an interval of about 9 or 10 days less than half a year so that if there be eclipses about the middle of January, the next eclipses may be expected about the first week of July.

On the Nature and Motion of Comets.

155. Comets are solid bodies revolving in very excentric ellipses about the sun in one of the foci, and are subject to the same laws as the planets are; but they differ in appearances from them; for they are very faint bodies, and in some of them, as they approach the sun, a tail of light begins to appear, which increases till the comet comes to its perihelion, and then it decreases again, and vanishes. The ancient philosophers supposed them to be planets. ARISTOTLE says, that some *Italians* called *Pythagoreans*, say, that a comet is one of the planets. APOLLONIUS affirms, that the comets were, by the *Chaldeans*, reckoned amongst the planets, and had their periods. SENECA having considered the phænomena of two remarkable comets, believed them to be of a great distance with the world, though he was ignorant of the laws which governed them: and foretold, that "time ages would unfold these mysteries. He recommended it to astronomers to keep a catalogue of them, in order to be able to determine whether they returned at certain periods. Notwithstanding this, most astronomers from his time to TYCHO BRAHE considered them only as meteors, existing in our atmosphere; but he, finding that they had no diurnal parallax, placed them above the moon. At length SIR I. NEWTON having proved that KEPLER's law, by which the motions of the planets are regulated, was a necessary consequence of his theory of gravity, it immediately followed, that comets were governed by the same law; and the observations upon them agreed so accurately with his theory, as to leave no doubt of its truth. Comets therefore revolve in very excentric ellipses about the sun in one of the foci. Astronomers, however, for the ease of calculation, suppose them to move in parabolic orbits, for that part which lies within the reach of observation, by which they can, with great accuracy, find the place of the perihelion; its distance from the sun; the inclination of the plane of its orbit to the ecliptic; and the place of the node, but not the periodic time.

156. DR HALLEY supposed that the comet which was observed by APIAN, in 1531, was the same as that which KEPLER and LONGOMONTANUS described in 1531; and the same as that which he observed in 1682; and having computed the effect of jupiter upon it at that time, he found that it would increase its periodic time above a year; in consequence of which he predicted its return at the end of the year 1758, or the beginning of 1759. He informs us that he did not make his computations with the utmost accuracy; but his prediction was right, for it was seen on Dec 14, 1758, and passed its perihelion on March 13, 1759. Thus he had the glory of first foretelling the return of a comet.

157. Comets are not visible till they return into the planetary regions. They are surrounded with a very dense atmosphere, and from the side opposite to the sun, they frequently send forth a tail, which increases as the comet approaches its perihelion, immediately after which it is longest and most luminous, and then it is generally a little bent and convex towards those parts to which the comet is moving; the tail then decreases, and at last it vanishes. The smallest stars are seen through the tail, notwithstanding its great thickness, which shows that the matter of it is extremely rare. ARISTOTLE thought the tail to be a thin fiery vapour arising from the comet. APIAN, CARDAN, TYCHO, and others, supposed that the sun's rays being propagated through the transparent head of the comet, were refracted, as by a lens. But the figure of the tail does not answer to this. KEPLER supposed that the sun's rays carried off some of the gross parts of the comet. SIR I. NEWTON thought that the tail was a very thin vapour which the head, or nucleus of the comet, sends out by reason of its heat. DR. HALLEY, in his description of the *Aurora Borealis* in 1716, says, "the streams of light so much resembled the long tails of comets, that at first sight they might be well taken for such." And afterwards, "this light seems to have a great affinity to that which the effluvia of electric bodies emit in the dark." D. DE MAIRAN calls the tail of a comet, the *Aurora Borealis* of the comet. This opinion DR. HAMILTON supports by the following arguments. The Aurora Borealis has no effect upon the stars seen through it, nor has the tail of a comet. The atmosphere is known to abound with electric matter, and the appearance of the electric matter in vacuo, is exactly like the appearance of the Aurora Borealis, which, from its great altitude, may be considered to be in as perfect a vacuum as we can make. The electric matter in vacuo suffers the rays of light to pass through, without being affected by them. The tail of a comet does not spread itself sideways, nor does the electric matter. Hence, he supposes the tails of comets, the aurora borealis, and the electric fluid, to be matter of the same kind.

158. In respect to the nature of comets, SIR I. NEWTON observes, that they must be solid bodies, like the planets. For if they were nothing but vapours, they must be dissipated when they come near the sun. For the comet in 1680, when in its perihelion, was nearer to the sun that one sixth of its diameter, therefore the heat of the comet at that time was to summer heat, as 28000 to 1. But the heat of boiling water is about 3 times greater than the heat which dry earth acquires from the summer sun; and the heat of red hot iron is about 3 or 4 times greater than the heat of boiling water. Therefore the heat of dry earth at the comet, when in its perihelion,

helion, was about 2000 times greater than red hot iron. By such heat, all vapours would be immediately dissipated.

159. This heat of the comet must be retained a long time. For a red hot globe of iron of an inch diameter, exposed to the open air, scarcely loses all its heat in an hour; but a greater globe would retain its heat longer, in proportion to its diameter, because the surface, at which it grows cold, varies in that proportion less than the quantity of hot matter. Therefore a globe of red hot iron as big as the earth, would scarcely cool in 50,000 years.

160. From the beginning of our æra to this time, it is probable, according to the best accounts, that there have appeared about 500 comets. Before that time, about 10[illegible] others are recorded to have been seen, but it is probable that not above one half of them were comets.

On the fixed Stars.

161. All the heavenly bodies beyond our system, are called *fixed stars*, because (some few excepted) they do not appear to have any proper motion of their own. From their immense distance, they must be bodies of very great magnitudes, otherwise they could not be visible; and when we consider the weakness of reflected light, there can be no doubt but that they shine with their own light. They are easily known from the planets, by their twinkling. Dr. Herschel, by his late improvements in telescopes, has discovered that the number of fixed stars is great beyond all conception. In the *milky way*, he has, in a quarter of an hour, seen 116,000 stars pass through his telescope, the field of view of which was only 15′ aperture. These stars, which can be of no use to us, are probably suns to other systems of planets.

162. From an attentive examination of the stars with good telescopes, many which appear only single to the naked eye, are found to consist of two, three, or more stars. Dr. Maskelyne had observed α *herculis* to be a double star; and other astronomers have discovered many others to be double. Dr. Herschel has found about 700, of which, not above 42 had been before observed. We will here mention a few of them.

α *Herculis*, a beautiful double star; the two stars very unequal; the largest is red, and the smallest blue, inclining to green.

γ *Andromedæ*, double, very unequal; the larger reddish white, the smaller a fine bright sky blue, inclining to green.

α *Geminorum*, double, a little unequal, both white.

β *Lyræ*, quadruple, unequal, white, but three of them a little inclined to red.

ι *Bootis*, double, very unequal, larger reddish, smaller blue, or rather a faint lilac.

υ *Lyræ*, treble, very unequal, larger white, smaller both dusky.

α *Lyræ*, double, very unequal, larger a fine brilliant white, smaller dusky.

These are a few of the principal double, treble, and quadruple stars mentioned by Dr. Herschel in the *Phil. Transf.* 1785.

163. Several stars mentioned by the ancient astronomers are not now to be found; and several are now observed, which do not appear in their catalogues. The most ancient observation of a new star, is that by Hipparchus, about 120 years before J. C. which occasioned his making a catalogue of the fixed stars, in order that future astronomers might see what alterations had taken place since his time. Cornelius Gemma, on Nov. 8, 1572, observed a new star in the *chair of cassiopea*. It exceeded *sirius* in brightness, and was seen at mid-day. It first appeared bigger than *jupiter*; but it gradually decayed, and after 16 months it entirely disappeared. It was observed by Tycho, who found that it had no sensible parallax; and he concluded that it was a fixed star.

164. Many stars appear and disappear at certain periods. On August 13. 1596, David Fabricius observed a new star in the *neck of the whale*. It disappeared after October in the same year. Phocylides Holwarda discovered it again in 1637; and after it had disappeared for 9 months, he saw it again. Bullialdus determined the periodic time of its greatest brightness to be 333 days. Its greatest brightness is that of a star of the second magnitude, and its least, that of a star of the sixth.

165. In 1686, Kirchius observed χ in the *swan* to be a changeable star, and found the period to be 425 days.

166. J. Goodricke, Esq. has determined the periodic variation of *algol*, or β *persei*, to be about 2d. 21h. Its greatest brightness is of the second, and least of the fourth magnitude. It changes from the second to the fourth, in about 3¼ hours, and back again in the same time, and retains its full brightness for the remaining time. He also discovered that β *lyræ*, and δ *cephei*, are subject to a periodic variation of brightness; the former in 12d. 19h. and the latter in 5d. 8h. 37¼′.

167. E. Pigott, Esq. discovered η *antinoi* to be a variable star, with a period of 7d. 4h 38′.

168. Dr. Herschel in the *Phil. Transf.* 1783, has given a large collection of stars which were formerly seen, but are now lost: also a catalogue of variable stars, and of new stars.

169. There have been various conjectures to account for the variable appearances of the changeable stars. M. Mauperituis supposes that they may have so quick a motion about their axis, that their centrifugal forces may reduce them to flat oblate spheroids, not much unlike a mill-stone; and its plane may be inclined to the plane of the orbits of its planets, by whose attraction the position of the body may be altered, so that when its plane passes through the earth, it may be almost or entirely invisible, and become visible again as its broadside is turned towards us. Others suppose that considerable parts of their surfaces are covered with dark spots, which render the body invisible when they are turned towards us. Others conjecture that their disappearance may

arise

arise from dark bodies revolving about them and interposing between them and us. The total disappearance of a star may probably be the destruction of its system; and the appearance of a new star, the creation of a new system of planets.

170 The fixed stars are not all evenly spread through the heavens, but the greater part of them are collected into clusters, which are discovered by high magnifying powers. With small powers they appear small whitish spots, called *nebulæ*. Some nebulæ however do not receive light from stars. HEYGENS discovered one in *orion's sword*; it consists only of 7 stars, and the other part is a bright spot. DR. HALLEY, in the southern hemisphere discovered one in the *centaur*, which is not visible here. He also discovered another in *hercules*. CASSINI discovered one between the *great dog* and *the ship*, which he describes as full of stars. M. DE LA CAILLE discovered 42 nebulæ. But DR. HERSCHEL has given us a catalogue of 2000 nebulæ and clusters of stars which he himself has discovered. He has also discovered other phænomena in the heavens, which he calls *nebulous stars*, that is, stars surrounded with a faint luminous atmosphere, of a considerable extent.

On the Constellations.

171. The ancients divided the heavens into *constellations*, or collections of stars, and represented them by animals and other figures, according as their disposition suggested. The number of the ancient constellations was 48, but the present number upon a globe is 70. Those stars which do not come into any of the constellations are called *unformed stars*. The stars visible to the naked eye, are divided into 6 classes, according to their magnitudes; the largest are called of the first magnitude, the next of the second, and so on. Those which cannot be seen by the naked eye, are called *telescopic* stars. The stars are marked upon the globes with greek letters; the first letter of the greek alphabet being put for the largest star of each constellation, and so on; and when more letters are wanted, the italic are generally used; this serves to point out the star, and they were first thus described by BAYER. The following catalogue contains the number of stars in each constellation, according to different astronomers.

The Ancient Constellations.

		Ptolemy	*Tycho*	*Hevelius*	*Flamstead*
Ursa minor	The little Bear	8	7	12	24
Ursa major	The great Bear	35	29	73	87
Draco	The Dragon	31	32	40	80
Cæpheus	Cæpheus	13	4	51	35
Bootes	Bootes	23	18	52	54
Corona borealis	The northern Crown	8	8	8	21
Hercules	Hercules kneeling	29	28	45	113
Lyra	The Harp	10	11	17	21
Cygnus	The Swan	19	18	47	81
Cassiopea	The Lady in the Chair	13	26	37	55
Perseus	Perseus	29	29	46	59
Auriga	The Waggoner	14	9	40	66
Serpentarius	Serpentarius	29	15	40	74
Serpens	The Serpent	18	13	22	64
Sagitta	The Arrow	5	5	5	18
Aquila	The Eagle	15	12	23	71
Antinous	Antinous		3	19	
Delphinus	The Dolphin	10	10	14	18
Equulus	The Horse's head	4	4	6	10
Pegasus	The flying Horse	20	19	38	89
Andromeda	Andromeda	23	23	47	66
Triangulum	The Triangle	4	4	12	16
Aries	The Ram	18	21	27	66
Taurus	The Bull	44	43	51	141
Gemini	The Twins	25	25	38	85
Cancer	The Crab	23	15	29	83

Leo

The Ancient Conſtellations continued.

		Ptolemy	Tycho	Hevelius	Flamſteed
Leo	The Lion	35	30	49	95
Coma Berenices	Berenice's Hair		14	21	43
Virgo	The Virgin	32	33	50	110
Libra	The Scales	17	10	20	51
Scorpius	The Scorpion	24	10	20	44
Sagittarius	The Archer	31	14	22	69
Capricornus	The Goat	28	28	29	51
Aquarius	The Water bearer	45	41	47	108
Piſces	The Fiſhes	38	36	39	113
Cetus	The Whale	22	21	45	97
Orion	Orion	38	42	62	78
Eridanus	Eridanus	34	10	27	84
Lepus	The Hare	12	13	16	19
Canis major	The great Dog	29	13	21	31
Canis minor	The little Dog	2	2	13	14
Argo	The Ship	45	3	4	64
Hydra	The Hydra	27	19	31	60
Crater	The Cup	7	3	10	31
Corvus	The Crow	7	4		9
Centaurus	The Centaur	37			35
Lupus	The Wolf	19			24
Ara	The Altar	7			9
Corona auſtralis	The ſouthern Crown	13			12
Piſcis auſtralis	The ſouthern Fiſh	18			24

The New Southern Conſtellations.

Columba Noachi	Noah's Dove	10
Robur Carolinum	The Royal Oak	12
Grus	The Crane	13
Phœnix	The Phœnix	13
Indus	The Indian	12
Paos	The Peacock	14
Apus, *Avis Indica*	The Bird of Paradiſe	11
Apis, *Muſca*	The Bee, or Fly	4
Chamæleon	The Chameleon	10
Triangulum auſtrale	The ſouth Triangle	5
Piſcis volans, *Paſſer*	The flying Fiſh	8
Dorado, *Xiphias*	The ſword Fiſh	6
Toucan	The American Gooſe	9
Hydrus	The water Snake	10

HEVELIUS'S *Constellations, made of the unformed Stars.*

Lynx	The Linx	19	44
Leo minor	The little Lion		53
Asteron and Chara	The Greyhounds	23	25
Cerberus	Cerberus	4	
Vulpecula and Anser	The Fox and Goose	27	35
Scutum Sobieski	Sobieski's Shield	7	
Lacerta	The Lizard		16
Camelopardalis	The Chamelopard	32	58
Monoceros	The Unicorn	19	31
Sextans	The Sextant	11	41

The constellations as far as the triangle, with Coma Berenices, are *northern*; those, after Pisces, in the ancient constellation, are *southern*. Besides the letters which are prefixed to the stars, many of them have names, as *sirius*, *regulus*, *arcturus*, &c.

On the proper Motion of the fixed Stars.

172. DR. MASKELYNE, in the first volume of his *Observations*, remarks, that many, if not all the fixed stars, have small motions amongst themselves, called their *proper* motions. From comparing his own observations with those of preceding astronomers, he first determined the proper motions of *sirius*, *castor*, *procyon*, *pollux*, *regulus*, *arcturus*, and α *aquilæ*; afterwards he determined the proper motions of 35 stars in right ascension. These are given in a catalogue of the right ascensions of 36 principal stars, which he has determined to an extreme degree of accuracy, and which are now generally used as fundamental stars, in order to determine the right ascensions of all the other heavenly bodies. M. MAYER has determined the proper motion of 56 stars.

173. If the sun be in motion as well as the stars, it will alter their apparent motion. In whatever direction our system may be supposed to move, it is easy to see what effect it will have on the apparent motion of the stars. DR. HERSCHEL finds, that if a point be assumed about the 77° of right ascension, and the sun to move from it, it will account for the proper motions in right ascension of the seven above mentioned stars of DR. MASKELYNE; and if, instead of supposing the sun to move in the equator, it should ascend to a point near to λ *herculis*, it will account for the observed change of declination of *sirius* and *arcturus*; he means, in respect to *direction*. He next observes, that this motion of the sun will account for many of the proper motions observed by MAYER. Also, *sirius* and *arcturus*, being the largest, are therefore probably the nearest, and hence, they ought to have the greatest apparent motion; and so we find they have. *Castor* is a double star; now, how extraordinary must such a concurrence appear, that two such stars should both have the same proper motion; for they are found to continue at the same distance from each other. This seems to point out the common cause, the motion of our system. From arguments of this kind, DR. HERSCHEL thinks that the solar system is in motion, in the direction above-mentioned.

On the Zodiacal Light.

174. The *zodiacal light* is a pyramid of light which sometimes appears in the morning and evening, before sun rise, and after sun set. It has the sun for its basis, and in appearance resembles the *aurora borealis*. Its sides are not straight, but a little curved, resembling a lens seen edge-ways. It is generally seen in October and March, the twilight then being shortest. It was observed by CASSINI in 1683, a little before the vernal equinox, in the evening, extending along the ecliptic from the sun. He thinks that it had been observed before; for MR. J CHILDREY, in a book published in 1661, gives an account of a phænomenon which was probably the same. M. FATIO de DUILLIER observed it soon after CASSINI. In 1707, on April 3, it was observed by MR. DERHAM in *Essex*. It appeared about a quarter of an hour after sun set, and extended 15° or 20° above the horizon. It is generally supposed, that it is matter which is thrown off from the sun, by its rotation about its axis.

On the Tides.

175. The true cause of the tides was discovered by KEPLER. He says that *gravity* is a power which is mutual between two bodies; and that the earth and moon would move towards each other, and meet at a point as much nearer to the earth than the moon, as the moon is less than the earth, if their motions in their orbits did not hinder them. And he further says, that the tides arise from the gravity of the waters towards the moon. SIR I NEWTON, from his *Theory of Gravity*, has explained the general principles upon which the phænomena of the tides depend, from the unequal gravitation of the different parts of the earth towards the sun and moon.

176. If

176. If the earth were entirely fluid, and at rest, by the mutual gravity of its parts it must form itself into a perfect sphere. But if one part be attracted by a distant body more than another, the figure must necessarily be changed.

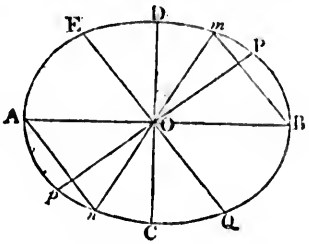
For let *ABDE* be the earth, supposed first to be a perfect sphere, and let *M* be a distant body attracting it; then as the force of attraction varies inversely as the square of the distance, the nearer parts of the earth to *M* will be more attracted than those further distant. The parts at *A* will therefore be more attracted towards *M* than those at the center *C*, and those at the center *C* more than those at *D*; so that A will be drawn from *C*, and *C* from *D*; and the effect of drawing *C* from *D* is the same as that of drawing *D* from *C* in the opposite direction. It is manifest therefore, that the parts at *A* and *D* will recede from *C*; and, in general, all the parts of *EAB* which are nearer to *M* than *C* is, will be drawn from *C*; and all the parts of *EDB*, which are further from *M* than *C* is, will be left by *C*, or may be supposed to be drawn from *C* in the opposite direction. Thus, the waters will rise higher at *A* and *D*, and being drawn from *ECB* both ways, they must fall at *E* and *B*, and the earth will put on the elliptical form *mnrs*, and make high tide at *m* and *r*, on opposite sides, at the same time; and there will be low tide at *n* and *s* at the same time, at two opposite points, which are 90° from the high tides. *M* may represent either the sun or moon; but the effect of the moon, from its nearness to the earth, is much greater than that of the sun; we consider therefore the moon as principally ruling the tides. As the earth turns about its axis once every day, every part of the earth will come once to the moon in a day, and once opposite to the moon, and therefore there will be two high tides every day, and the water will fall to its lowest, twice in a day. Or more accurately, the two tides happen in about 24h. 51′; for on account of the moon's motion in her orbit, it is that interval from the time the moon leaves the meridian till she returns to it the next time.

177. When the sun and moon are in conjunction, or in opposition to each other, they will both tend to raise the waters at the same places, and therefore the tides will then be the highest, and these are called *spring* tides; but when the sun and moon are 90° from each other, the sun will tend to depress those parts which the moon tends to raise, and therefore they opposing each others effects, the tides will then be the lowest; and these are called *neap* tides. Hence, there will be the highest tides at new and full moon, and lowest when the moon is at her first and third quarters.

178. The water will continue to rise for some time after it has passed the moon, as the effect of the moon continue though in a smaller degree, so that the water will not be the highest at the time when the moon is on the meridian, but it will sometimes happen, one, two, or three hours after, according to the circumstances which may oppose the motion of the waters.

179. Sir I. Newton has shown that the effect of the moon to raise the tides, increases as the cube of the distance decreases; hence, when the moon is at its least distance, the effect will be the greatest. The same is true in respect to the sun.

180. The tides are greatest when the attracting body, sun or moon, is in the equator.



For let, for instance, the moon be in the equator *ACBD*, and let *A* and *B* be the two points of high tide, and *C* and *D* the two points of low tide; then the axis of the earth being here perpendicular to the plane *ACBD*, a spectator at *A* or *B*, where it is high tide, will, by the earth's rotation, be carried to *C* or *D*, where it is low tide, and therefore the difference between *OA* and *OC* will express the difference of the heights of the water at high and low tide. Now suppose *POp* to be

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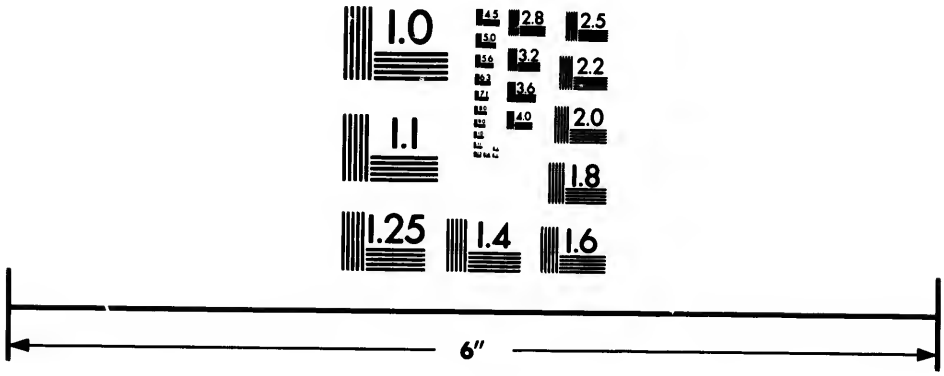

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be the earth's axis, EQ the equator, An, Bm, two parallels to it, the moon describing the parallel An. Then by the earth's rotation, the places A and B are carried from A to n, and from B to m, and then from n to A, and from m to B. Hence, the high tides to those two places are at A and B, and the low tides at n and m; therefore the difference between the height of the high and low tides will be the difference of OA and On, and of OB and Om; and as Om and On, are greater than OC, the difference of the tides is less here than when the moon was in the equator. Hence, the tides are highest when the moon is in the equator; and as the moon recedes from the equator, the tides diminish.

181. Hence, the highest tides are when the new or full moon happens at the time when the sun is in the equator, or about March 22d, and September the 22d, for then the moon, which is in conjunction with or opposition to the sun at those times, must also be in the equator. And if the moon be also then at its nearest distance, the tides will be the greatest of all

182. That the tides may have their full effect, the surface of the earth ought to be covered with water; and hence, in large seas the effect is greatest. This is the reason that the tides are not so great in the torrid zone, between *Africa* and *America*, where the ocean is narrower, as in the temperate zones on either side. And from this we may understand why the tides are so small in islands that are very far distant from shores In the Atlantic, the water cannot rise on one shore but by descending on the other; so that, at the intermediate distant islands, it will vary but a little from the mean height.

183. As the tides pass over shoals, and run through straights into bays of the sea, their motion becomes more various, and their heights depend on many circumstances. It is high water on the coasts of *Spain* and the west of *Ireland*, about 3 hours after the moon has passed the meridian. From thence it flows into the adjacent channels, as it finds the easiest passage. One current from it, for example, runs up by the south of *England*, another comes in by the north of *Scotland*. They take a considerable time to move all this way, and it is high water sooner in the places to which they first come; and it begins to fall at these places, whilst they are rising further on in their course. As they return they are not able to raise the tide, because the water runs faster off then it returns, till, by a new tide from the open ocean, the return of the current is stopped, and the water begins to rise again. The tide takes 12 hours to come from the ocean to *London*, so that when it is high water there, a new tide is already come into the ocean, and in some intermediate place, it must be low water at the same time. When the tides run over shoals, and flow upon flat shores, the water rises to a greater height than in the deep and open oceans; because the force of its motion cannot be broke upon level shores, till the water rises to a great height.

184. If a place communicate with two oceans, or two ways with the same ocean, one of which is a readier passage than the other, two tides may arrive at that place at different times, which interfering with each other, may produce a variety of phænomena. At *Batsha*, a port in the kingdom of *Tunquin*, in the *East Indies*, in latitude 20° 50′ N. the day in which the moon passes the equator, the water stagnates without any motion: as the moon removes from the equator, the water begins to rise and fall once a day, and it is high water at the setting of the moon, and low water at her rising. This daily tide increases for about 7 or 8 days, and then decreases by the same degrees for the same time, till the motion ceases at the moon's return to the equator. When she has passed the equator, and declines southward, the water rises and falls again as before: but it is high water now at the rising, and low at the setting of the moon.

185. Sir I. Newton thus accounts for this phænomenon. To *Batsha* there are two inlets, one from the *Chinese* Ocean between the Continent and the *Manillas*, the other from the *Indian* Ocean between the Continent and *Borneo*; and he supposes that a tide may arrive at *Batsha*, through one of these inlets, at the third hour of the moon, and the other through the other inlet 6 hours after. For whilst these tides are equal, the one flowing out as the other flows in, the water must stagnate. Now they are equal when the moon is in the equator; but when the moon gets on the same side of the equator with *Batsha*, the daily tide exceeds the nightly, so that two greater and two less tides must arrive at *Batsha* by turns. The difference of these will produce an agitation of the water, which will rise to its greatest height at the mean time between the two greatest tides, and fall lowest at the mean time between the two least tides; so that it will be high water about the sixth hour at the setting of the moon, and low water at her rising. When the moon gets on the other side of the equator, the nightly tide will exceed the daily, and therefore the high tide will be at the rising, and the low tide at the setting of the moon. The same principles will account for other extraordinary tides which are observed.

186. There are no tides in lakes, because they are generally so small, that the moon attracts every part of them equally, and therefore no part of the water is raised above the other. The *Mediterranean* and *Baltic* Seas have very small tides, because the inlets by which they communicate with the ocean are so narrow that they cannot, in so short a time, receive or discharge enough to raise or sink their surfaces sensibly In the *Mediterranean*, the tides produce a variation of about 1 foot in the height of the waters.

To find the Longitude of Places upon the Earth's Surface.

187. The situation of a place upon the surface of the earth, is determined from its latitude and longitude. The methods of finding the latitude we have already explained; but the longitude cannot be so readily found.

found.* *Philip* III. king of *Spain*, was the first person who offered a reward for its discovery; and the *States* of *Holland* soon after followed his example. During the minority of LEWIS XV. of *France*, the regent power promised a great reward to any person who should discover the longitude at sea. In the time of CHARLES II the Sieur de St. PIERRE, a Frenchman, proposed a method of finding the longitude by the moon. Upon this, a commission was granted to Lord Viscount BROUNKER, president of the Royal Society, Mr. FLAMSTEAD, and several others, to receive his proposals, and give their opinions respecting it. Mr. FLAMSTEAD gave his opinion, that if we had the places of the fixed stars, and tables of the moon's motion, we might find the longitude, but not by the method of the Sieur de St. PIERRE. Upon this, Mr. FLAMSTEAD was appointed astronomer royal, and an observatory was built at Greenwich for him; and the instructions to him and his successors were, "that they should apply themselves with the utmost care and diligence, to rectify the tables of the motions of the heavens, and the places of the fixed stars, in order to find out the so much desired longitude at sea, for the perfecting of the Art of Navigation."

188. In the year 1714, the *British* parliament offered a reward for the discovery of the longitude; the sum of 10000*l.* if the method determined the longitude to 1° of a great circle, or to 60 geographical miles; of 15000*l.* if it determined it to 40 miles; and of 20000*l.* if it determined it to 30 miles: with this proviso, that if any such method extend no further than 30 miles adjoining to the coast, the proposer should have no more than half the rewards. The act also appoints the first Lord of the Admiralty, the Speaker of the House of Commons, the first Commissioner of Trade, the Admirals of the Red, White, and Blue Squadrons, the Master of Trinity House, the President of the Royal Society, the Royal Astronomer at Greenwich, the two Savilian Professors at Oxford, and the Lucasian and Plumian Professors at Cambridge, with several other persons, as Commissioners for the Longitude at Sea. The Lowndian Professor at Cambridge was afterwards added. After this act of parliament, several other acts passed in the reigns of GEORGE II. and III. for the encouragement of finding the longitude. At last, in 1774, an act passed, repealing all other acts, and offering separate rewards to any person who should discover the longitude, either by the watch keeping true time within certain limits, or by the lunar method, or by any other means. The act proposes as a reward for a time keeper, the sum of 5000*l.* if it determine the longitude to 1° or 60 geographical miles; the sum of 7500*l.* if it determine it to 40 miles; and the sum of 10000*l* if it determine it to 30 miles, after proper trials specified in the act. If the method be by improved solar and lunar tables, constructed upon SIR I. NEWTON's Theory of Gravitation, the author shall be entitled to 5000*l.* if such tables shall show the distance of the moon from the sun and stars, within fifteen seconds of a degree, answering to about seven minutes of longitude, after allowing half a degree for the errors of observation. And for any other method, the same rewards are offered as those for time-keepers, provided it gives the longitude true within same limits, and be practicable at sea. The commissioners have also a power of giving smaller rewards, as they shall judge proper to any one who shall make any discovery for finding the longitude at sea, though not within the above limits. Provided however, that if such person or persons shall afterwards make any further discovery as to come within the above mentioned limits, such sum or sums as they may have received, shall be considered as part of such greater reward, and deducted therefrom accordingly.

189. After the decease of MR FLAMSTEAD, DR. HALLEY, who was appointed to succeed him, made a series of observations on the moon's transit over the meridian, for a complete revolution of the moon's apogee, which observations being compared with the computations from the tables then extant, he was enabled to correct, the tables of the moon's motions. And as Mr. HADLEY had then invented an instrument by which the altitudes and distances of the heavenly bodies could be taken at sea, Dr. HALLEY strongly recommended the lunar method of finding the longitude.

To find the Longitude by a Time-keeper.

190. The sun appears to move round the earth from east to west, or to describe 360°, in 24 hours, and therefore he appears to move 15° in an hour. If therefore the meridians of two places, make an angle of 15° with each other, or if the two places differ 15° in longitude, the sun will come to the eastern meridian 1 hour before he comes to the western meridian, and therefore when it is 12 o'clock at the former place, it is only eleven at the latter; and in general, the difference between the times by the clock at any two places, will be the difference of their longitudes, converted into time at the rate of 15° for an hour, the time at the eastern place being the forwardest. If therefore we can tell what o'clock it is at any two places, at the same instant of time, we can find the difference of their longitudes, by allowing 15° for every hour that the clocks differ.

* In many of the old maps, the first meridian is made to pass through *Ferro* in the Canaries, which is 17°. 45'. 50" west of Greenwich. To reduce therefore the longitude from Ferro to that from Greenwich, *add* 17°. 45'. 50" if the place be *west* of Ferro, and it gives the longitude west from Greenwich; if the place be *east* of Ferro, and in longitude *less* than 17°. 45'. 50". the difference of its longitude and 17°. 45'. 50", shows the longitude west from Greenwich; but if the longitude be *greater* than 17°. 45'. 50", the difference shows the longitude east of Greenwich. Thus you may reduce the longitude from one place to that from any other.

191. Let therefore the time keeper be well regulated and set to the time at *Greenwich*, that being the place from which we reckon our longitude; then if the watch neither gains nor loses, it will always show the time at *Greenwich*, wherever you may be. Now to find the time by the clock at any other place, take the sun's altitude, and thence find the time by article 61; now the time thus found is *apparent* time, or that found by the sun, which differs from the time shown by the clock by the *equation of time*, as we have shown in article 79: we must therefore apply the equation of time to the time found by the sun, and we shall get the time by the clock; and the difference between the time by the clock so found, and the time by the time keeper, or the time at *Greenwich*, converted into degrees at the rate of 15° for an hour, gives the longitude of the place from *Greenwich*. For example, let the time by the time-keeper, when the sun's altitude was taken, be 6h. 19′, and let the time deduced from the sun's altitude be 9h. 27′, and suppose at that time the equation of time to be 7′, showing how much the sun is that day behind the clock, then the time by the clock is, 9h. 34′, the difference between which and 6h. 19′ is 3h. 15′,; and this converted into degrees, at the rate of 15° for 1 hour, gives 48°. 45′, the longitude of the place from *Greenwich*; and as the time is forwarder than that at *Greenwich*, the place lies to the *east* of *Greenwich*. Thus the longitude could be very easily determined, if you could depend upon the time-keeper. But as a watch will always gain or lose, before the time-keeper is sent out, its gaining or losing every day for some time, a month for instance, is observed; this is called the *rate of going* of the watch, and from thence the *mean* rate of going is thus found.

192. Suppose I examine the rate of a watch for 30 days; on some of those days I find it has gained, and on some it has lost; add together all the quantities it has gained, and suppose they amount to 17″; add together all the quantities it has lost, and suppose they amount to 13″; then, upon the whole, it has gained 4″ in 30 days, and this is called the *mean* rate for that time, and this divided by 30, gives 0″,133 for the *mean daily* rate of gaining; so that if the watch had gained regularly 0″,133 every day, at the end of the 30 days it would have gained just as much as it really did gain, by sometimes gaining and sometimes losing. Or you may get the *mean daily* rate thus. Take the *difference* between what the clock was too fast, or too slow, on the first and last days of observation, if it be too fast, or too slow, on each day; but take the *sum*, if it be too fast on one day and too slow on the other, and divide by the number of days between the observations, and you get the mean daily rate. Thus, if the watch was too fast on the first day 18″, and too fast on the last day 32″, the *difference* 14″ divided by 30 gives 0″, 466 the *mean daily* rate of gaining. But if the watch was too fast on the first day 7″, and too slow on the last day 0″, the *sum* 17″ divided by 30 gives 0″, 566 the *mean daily* rate of losing. After having thus got the mean daily rate of gaining or losing, and knowing how much the watch was too fast or too slow at first, you can tell according to that rate of going, how much it is too fast or too slow, at any other time. In the first case, for instance, let the watch have been 1′. 17″ too fast at first, and I want to know how much it is too fast 50 days after that time; now it gains 0″, 133 every day, if this be multiplied by 50 it gives 6″, 65 for the whole gain in 50 days; therefore at the end of that time the watch would be 1′. 23″,65 too fast. This would be the error, if the watch continued to gain at the above rate: and although, from the different temperatures of the air, and the imperfection of the workmanship, this cannot be expected, yet the probable error will by this means be diminished, and it is the best method we have to depend upon. In watches which are under trial at the Royal Observatory at *Greenwich* as candidates for the rewards, this allowance of a mean rate is admitted, although it is not mentioned in the act of parliament; the commissioners however are so indulgent as to grant it, which is undoubtedly favourable to the watches.

193. As the rate of going of a watch is subject to vary from so many circumstances, the observer whenever he goes ashore, and has sufficient time, should compare his watch for several days with the true time found by the sun, by which he will be able to find its rate of going. And when he comes to a place whose longitude is known, he may then set his watch again to *Greenwich* time; for when the longitude of a place is known, you know the difference between the time there and at *Greenwich*. For instance, if he go to a place known to be 30° east longitude from *Greenwich*, his watch should be 2 hours slower than the time at that place. Find therefore the true time at that place, by the sun, and if the watch be 2 hours slower, it is right; if not, correct it by the difference, and it again gives *Greenwich* time.

194. In long voyages, unless you have sometimes an opportunity of adjusting the watch to *Greenwich* time, its error will probably be considerable, and the longitude deduced from it, will be subject to a proportional error. In short voyages, a watch is undoubtedly very useful; and also in long ones, where you have the means of correcting it from time to time. It serves to carry on the longitude from one known place to another, supposing the interval of time not very long; or to keep the longitude from that which is deduced from a lunar observation, till you can get another. Thus the watch may be rendered of great service in navigation.

To find the Longitude by an Eclipse of the Moon, and of Jupiter's Satellites.

195. By an eclipse of the *moon*. This eclipse begins when the umbra of the earth first touches the moon, and ends when it leaves the moon. Having the times calculated when the eclipse begins and ends at *Greenwich*, observe the times when it begins and ends at the place where you are; and the difference of these times, converted into degrees, gives the difference of the longitudes. For as the phases of the moon in an eclipse, happen at the same instant at all places, the difference of the

the times at different places when the same phase is observed, arises from the difference of the clocks at those places, and that difference (as before observed) converted into degrees, gives the difference of longitudes. If the beginning of an eclipse happen at 6 o'clock at one place, and at 8 o'clock at another, these places differ 2 hours, or 30°, in longitude. This would be a very ready and accurate method, if the times of the first and last contact of the earth's umbra and the moon could be accurately observed; but the darkness of the penumbra continues to increase till it comes to the umbra, so that until the umbra actually gets upon the moon, it is not discovered. The umbra itself is also badly defined. The beginning and end of a lunar eclipse, cannot, in general, be determined nearer than 1′ of time, and often not nearer than 2′ or 3′. Upon these accounts, the longitude, thus deduced, is subject to a considerable degree of uncertainty. Astronomers therefore determine the difference of longitudes of two places, by corresponding observations of other phases, that is, when the umbra bisects any spots upon the surface. And this can be determined to a greater degree of accuracy, than the beginning and end; for when the umbra is got upon the moon's surface, the observer has leisure to consider and fix upon the proper line of termination, in which he will be assisted by running his eye along the circumference of the umbra. Thus the coincidence of the umbra with the spots, may be observed to a considerable degree of accuracy. The observer therefore should have a good map of the moon at hand, that he may not mistake. The telescope to observe a lunar eclipse, should have but a small magnifying power with a great quantity of light. The shadow comes upon the moon on the east side, and goes off on the west; but if the telescope invert, the appearance will be the contrary.

196. The eclipses of jupiter's satallites afford the readiest method of determining the longitude of places upon land. It was also hoped, that some method might be invented to observe them at sea, and Mr. IRWIN made a chair to swing for that purpose, for the observer to sit in; but Dr. MASKELYNE, in a voyage to *Barbadoes*, under the direction of the commissioners of longitude, found it totally impracticable to derive any benefit from it; and he observes, that "considering the great power requisite in a telescope for making these observations well, and the violence as well as the irregularities of the motion of the ship, I am afraid the complete management of a telescope on ship board, will always remain among the desiderata. However, I would not be understood to mean to discourage any attempt, founded on good principles, to get over the difficulty." The telescopes proper for making these observations, are common refracting ones from 15 to 20 feet; reflecting ones of 18 inches or 2 feet; or the 46 inches achromatic. On account of the uncertainty of the theory of the satellites, Dr. MASKELYNE advises the observer to be settled at his telescope, 3 minutes before the expected time of immersion of the first satellite; 6′ or 8′ before that of the second or third; and a quarter of an hour before that of the fourth. And if the longitude of the place be also uncertain, he must look out proportionably sooner. Thus, if the longitude be uncertain to 2°, answering to 8 minutes of time, he must begin to look out 8 minutes sooner than is mentioned above. However, when he has observed one eclipse and found the error of the tables, he may allow the same correction to the calculations of the *Ephemeris* for several months, which will advertise him very nearly of the time of expecting the eclipses of the same satellite, and dispense with his attending so long. *Before* the opposition of jupiter to the sun, the immersions and emersions happen on the *west* side of jupiter; and *after* opposition, on the *east* side; but if the telescope invert, the appearance will be the contrary. *Before* opposition, the *immersions* only of the first satellite are visible; and *after* opposition, the *emersions* only. The same is generally the case in respect to the second satellite; but both immersion and emersion are frequently observed in the third and fourth.

197. When the observer is waiting for an emersion, as soon as he suspects that he sees it, he should look at his watch and note the second; or begin to count the beats of the clock, till he is sure it is the satellite, and then look at the clock and subtract the number of seconds which he has counted, and he will have the time of emersion. If jupiter be 8° above the horizon, and the sun as much below, an eclipse will be visible; this may be determined near enough by a common globe.

198. The emersion or immersion being observed according to apparent time, the longitude of the place from *Greenwich* is found, by taking the difference between that time and the time set down in the *Nautical Almanac*, which is calculated for *apparent* time.

Ex. Suppose the emersion of a satellite to have been observed at the *Cape of Good Hope*, May 9, 1767, at 10h. 46′. 45″ apparent time; now the time in the *Nautical Almanac* is 9h. 33′. 12″; the difference of which times is 1h. 13′. 33″ the longitude of the Cape *east* of Greenwich in time, or 18°. 23′. 15″.

199. But to find the longitude of a place from an observation of an eclipse of a satellite, it is better to compare it with an observation made under some well known meridian, than with the calculations in the *Ephemeris*, because of the imperfection of the theory; but where a corresponding observation cannot be obtained, find what correction the calculations in the Ephemeris require, by the nearest observations to the given time that can be obtained; and this correction applied to the calculation of the eclipse in the *Ephemeris*, renders it almost equivalent to an actual observation. The observer must be careful to regulate his clock or watch to apparent time, or at least to know the difference.

200. In order the better to know the difference of longitudes of two places, from corresponding observations, the observer should be furnished with the *same* kind of telescopes. For at an immersion, as the satellite enters the shadow, it grows fainter and fainter, till at last the quantity of light is so small that it becomes invisible,

invisible, even before it is wholly immersed in the shadow; the instant therefore that it becomes invisible will depend upon the quantity of light which the telescope receives, and its magnifying power. The instant therefore of its appearance will be later, the better the telescope is; and the sooner it will appear at its emersion. Now the immersion is the instant the satellite is got into the shadow, and the emersion is the instant before it begins to emerge from the shadow; if therefore two telescopes show the disappearance or appearance of the satellite at the same distance of time from the immersion or emersion, the difference of the times will be the same as the difference of the true times of immersion or emersion, and therefore will show the difference of longitudes accurately. But if the observed time at one place and the computed time at another be compared, we must allow for the difference of the apparent and true times of immersion and emersion, in order to get the true time where the observation was made, to compare with the true time from computation at the other place. This difference may be found, by observing an eclipse at any place whose longitude is known, and comparing it with the time by computation. Observers, therefore, should settle the difference by the mean of a great number of observations thus compared with the computations, by which means the longitude will be more accurately ascertained. After all, however, the different states of the air, and of the eye, will cause some uncertainty; but the latter may in a great measure be obviated, if the observer remove himself from all warmth and light, for a little time before he observes.

To find the Longitude by the Moon's Distance from the Sun, or a fixed Star.

201. The steps by which we find the longitude by this method, are these.

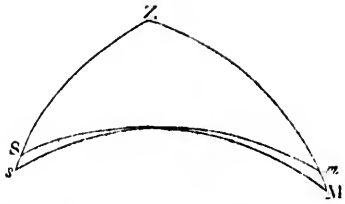
1 From the observed altitudes of the moon and the sun, or a star, and their *observed* distance, find their *true* distance.

2. From the *Nautical Almanac* find the apparent time at *Greenwich* when the moon was at that distance.

3. From the altitude of the sun or star, find the apparent time at the place of observation.

4. The difference of the times thus found, gives the difference of the longitudes, or the longitude from *Greenwich*.

We will here fully explain each of these.



Let Z be the zenith of the place of observation, M the apparent place of the moon, m its true place, S the apparent place of the sun or star, s the true place; then as the parallax of the moon depresses it more than refraction raises it, the apparent place M is below the true place m; but the star is elevated by refraction and has no parallax to depress it, and the sun is more elevated by refraction than depressed by parallax, therefore the true place s is below the apparent place S. Now the apparent altitudes being found by observation, we know the apparent zenith distances ZM, ZS; and knowing their apparent distance MS, we know the three sides of the triangle ZSM; hence, we can find the angle Z. Now find from the Tables the parallax and refraction of the moon, and their difference is Mm; do the same for the sun, and we get Ss, or if it be a star, the refraction gives Ss. From ZM subtract Mm, and we get Zm; and to ZS add Ss, and we get Zs; hence, in the triangle Zsm, we know Zs, Zm, and the angle Z, to find sm the *true* distance of the moon from the sun or star.

Example. Suppose on June 29, 1793, the sun's apparent zenith distance ZS was observed to be 70°. 56′. 24″, the moon's apparent zenith distance ZM to be 48°. 53′. 58″, and their apparent distance MS to be 103°. 29′. 27″. Then the true distance sm being computed according to the above method, it is found to be 103°. 3′. 18″.

202. The true distance of the moon from the sun being found, the next thing is to find from thence, the time at *Greenwich*. Now in the *Nautical Almanac* the true distance of the moon from the sun or certain fixed stars, such as lie in or near the moon's path, is put down for every three hours. The true distance therefore being known, look into the *Nautical Almanac*, and take out two distances, one greater and the other less than the known true distance as found above, and the difference D of these distances shows how much the moon approaches

approaches to or recedes from the sun or star, in three hours; and take the difference *d* between the moon's distance at the beginning of that interval, and the distance found from observation, and then say, *D : d : :* 3 hours: the time the moon is acceding to or receding from the sun or star through the space *d*, which added to the time at the beginning of the interval, gives the apparent time at *Greenwich*, corresponding to the true distance of the moon, as deduced from observation.

EXAMPLE. Taking the moon's true distance 103°. 3′. 18″ on June 29, 1793, as deduced in the last example, to find the apparent time at Greenwich.

True distance of ☽ from ☉ - - -	103°,	3′.	18″
True distance on June 29, at 3h. by *Nautical Almanac* -	103.	4.	58
True distance on June 29, at 6h. by *Nautical Almanac* -	101.	26.	42
D= - - - - - - - -	1.	38.	16
d= - - - - - - - -	0.	1	40

Hence, 1°. 38′. 16″ : 0°. 1′. 40″ :: 3h : 0h. 3′. 3″, which added to 3 hours gives 3h. 3′. 3″ the apparent time at *Greenwich*.

203. The next thing to be done, is to find the time at the place of observation, knowing the sun's declination, the latitude of the place, and the sun's altitude.

EXAMPLE. The sun's declination was 23°. 14′. 4″ and its observed altitude was 19°. 3′. 36″, and the latitude was 52°. 12′. 35″.

Now the refraction was 2′. 44″, and the parallax 8″; hence, the true altitude was 19°. 1′; and by article 61, the apparent time is found to be June 28, 18h. 5′. 29″.* Hence,

Apparent time at Greenwich, June 29 - - -	3h.	3′.	3″
Apparent time at place of observation, June 28 - -	18.	5.	29
Longitude of place of observation in time - - -	8.	57.	34

Which converted into degrees, gives 123°. 50′. 16″, the *longitude* of the *place of observation* west of *Greenwich*.

204. Thus we have explained the regular steps by which the longitude is found by observing the moon's distance from the sun, or a fixed star; but for a full explanation, we refer the reader to Mr. VINCE's *Complete System of Astronomy*, in which work he will find all the various calculations explained at large; and where he will also see three other methods of finding the longitude; one, by a solar eclipse; another, by an occultation of a fixed star by the moon; and a third by the moon's transit over the meridian, compared with that of a fixed star. These are of too difficult a nature to admit of a popular explanation.

205. The above method of finding the longitude by the moon, was brought into practice by DR. MASKELYNE, who proved the accuracy of it in two voyages one to *St. Helena*, and the other to *Barbadoes*, by the following irrefragable proofs: 1st, On the near agreement of the longitude, inferred from observations made within a few days or hours of making land, with the known longitude of such land. 2d, From the near agreement of the longitude of the ship from observations made on a great many different days near to one another, when connected by help of the common reckoning. 3d, From the near agreement of the longitude of the ship, deduced from observations of stars on different sides of the moon, taken on the same night. For here all the most probable kinds of errors operating different ways, their effect, if any, must have appeared in the result. But in all the double longitudes thus found, their differences were so small, as to warrant him to say, that by good instruments and careful observers the longitude may be thus found to a very great degree of accuracy.

On the Use of the Globes.

206. There are two globes one called the *terrestrial*, upon which the places of the earth are delineated, and the other called *celestial*, upon which all the principal fixed stars are put down, and the figures of the constellations. The terrestrial globe is a perfect map of the earth, representing the relative situations of all the places upon its surface, with the true figures of all the different countries, which cannot be properly represented upon a map; and this renders a terrestrial globe very necessary for the study of geography. The celestial globe serves to explain all the phænomena arising from the diurnal

* The astronomical day begins at noon, so that June 28, 18h. 5′. 29″ is according to the common reckoning, June 29, 6h. 5′. 29″ in the morning.

motion of the earth about its axis, and also the variation of seasons arising from its motion about the sun, only supposing the sun to move in the ecliptic instead of the earth, which will not alter any of the appearance To each globe there is a circular, flat piece of wood, the plane of which passes through the center of the globe, on which are marked the days of the month, and corresponding to them the signs of the ecliptic, where the sun is on those days; the points of the compass are also put upon the same piece. This is called the *horizon*; at right angles to which, there is a circular piece of brass, on which the globe hangs, called the *brazen meridian*; it is supported at the lowest point on a roller, on which it turns in its own plane, and passes through the horizon in two grooves cut for that purpose; on this circle the globe is supported by the extremities of its axis; and the axis passes through the brazen meridian, and carries an index round with it over a circular plate which is divided into hours, &c. On each globe there are two circles, one representing the *ecliptic*, with the characters of the signs upon it, and the other the *equator*. To each of these circles, on the celestial globe, secondaries are drawn to every 10 or 15 degrees; but on the terrestrial globe, they are drawn only to the equator. There is also a flat piece of brass, called the *quadrant of altitude*, which is occasionally fixed to the brazen meridian in its zenith, by a nut, and the lower end is put between the globe and the horizon, and can be turned round to any point; it is divided into degrees, &c. by which the altitudes of objects above the horizon may be found, and their azimuths determined. From one point of the brazen meridian corresponding to the equator, the degrees begin, and are continued both ways up to 90° at each pole; but for the other semicircle of the brazen meridian, the degrees begin at the poles, and are continued up to 90° at the equator. On the horizon, the degrees begin at the east and west points, and are continued both ways to 90°, or to the north and south points. The ecliptic and equator begin their degrees at one of their intersections, called *aries*, and they are continued round the same way to 360°; also, the former is divided into, and marked with, the twelve signs; and the latter is divided from the same point, into 24 hours. Upon the foot of the globe there is often put a compass, by which the brazen meridian may be set north and south.

On the Use of the TERRESTRIAL *Globe.*

207. *To find the Latitude of a Place.*

Bring the place under that semicircle of the brazen meridian where the divisions begin at the equator, and observe what degree the place is under, and it is the latitude required.

208. *To rectify the Globe to the Latitude of a Place.*

Elevate the pole above the horizon till its altitude, observed on the brazen meridian, be equal to the latitude of the place, and it is then said to be rectified to the latitude, and it so far stands right for the solution of all problems for that latitude.

209. *To find the Longitude of a Place from Greenwich.*

Bring the place to the graduated edge of the brazen meridian, and observe the point of the equator which lies under it, and the distance of that point from the point where the meridian of Greenwich cuts the equator, is the longitude required.

210. *Given the Latitude and Longitude of a Place, to find where the Place is.*

Bring the given degree of longitude to the brazen meridian, and then under the given degree of latitude upon that meridian you have the place required.

211 *When it is Noon at any Place A, to find the Hour at any other Place B.*

Bring A to the meridian, and set the index to XII; then turn the globe till B comes under the meridian, and the index will show the hour at B. If it be not noon at A, set the index to the hour, and proceed as before, and you get the corresponding hour at B.

212. *To find the Distance of A from B.*

Bring A to the meridian, and screw the quadrant of altitude over it, and carry it to B, and you get the number of degrees between A and B, which multiply by 69,2, the miles in one degree, and you get the distance required.

213. *To find the Bearing of B from A.*

Rectify the globe for the latitude of A, and bring A to the meridian, and fix the quadrant of altitude to A; then direct the quadrant to B, and the point where it cuts the horizon shows the bearing required.

214. *At any Hour of the Day at B, to find the Place A to which the Sun is vertical.*

Find the sun's place in the ecliptic, and bring it to the brazen meridian, and you find its declination on the meridian; then bring B to the meridian, and set the index to the given hour, and turn the globe till the index comes to XII at noon, and the place under the sun's declination upon the meridian, is that required.

215. *To find, at any Day and Hour, the Places where the Sun is rising, setting, or on the Meridian; also, those Places which are enlightend, and where the Twilight is beginning and ending.*

Find (by art. 214.) the place to which the sun is vertical at the given hour, and bring the same to the meridian, and rectify the globe to a latitude equal to the sun's declination. Then to all those places under the *western* semicircle of the horizon, the sun is *rising*; to those under the *eastern* semicircle, the sun is *setting*; and to those under the *meridian*, it is *noon*.

Also, all places above the horizon are enlightened, and all those below are in the dark hemisphere.

Lastly, in all those places 18° below the western horizon, the twilight is just beginning in the morning, and in those

those 18° below the eastern horizon, it is just ending in the evening.

216. *To find all the Places to which a Lunar Eclipse is visible at any Instant.*

Find the place to which the sun is vertical at any time, and bring that place to the zenith, and the eclipse will be visible to all the hemisphere *under* the horizon, because the moon is then opposite to the sun.

On the Use of the Celestial *Globe.*

217. *To find the Sun's right Ascension and Declination.*

Bring the sun's place in the ecliptic to the brazen meridian, and it points out upon the meridian, the declination; and the degree of the equator which is cut by the meridian, is the right ascension.

218. *Given the right Ascension and Declination of an heavenly Body, to find its Place.*

Bring the given degree of right ascension on the equator, to the brazen meridian, and the degree of the meridian corresponding, to the declination, points out the place required.

219. *Given the Latitude of a Place, the Day and Hour, to find the Altitude and Amplitude of a given heavenly Body.*

Rectify the globe (by art. 208,) to the latitude of the place, and bring the sun's place in the ecliptic to the brazen meridian, and set the index to XII; then turn the globe till the index points to the given hour, and in that position the globe represents the proper situation of all the heavenly bodies, in respect to the meridian and horizon. Then fix the quadrant of altitude to the zenith, and direct its graduated edge to the place of the body, and it shows the altitude of the body; and the degree where it cuts the horizon, shows its amplitude. If the body be the moon or a planet, after having found its place, you may put a small patch to denote its place.

220. *Given as before, to set the Globe so that the Stars upon it may correspond to their Situations in the Heavens.*

The globe being fixed as in the last article, by means of the compass let the brass meridian be set in the meridian of the place, with the north pole to the north; then will all the stars upon the globe correspond to their places in the heavens, so that an eye at the center of the globe would refer every star on its surface to the place of the star in the heavens. By comparing therefore the stars in the heavens with their places on the globe, you will easily get acquainted with the stars.

221. *To find the Time when any of the heavenly Bodies rise, set, or come to the Meridian; also, their Azimuth at rising or setting.*

Rectify the globe to the latitude of the place, and bring the sun's place in the ecliptic to the meridian, and set the index to XII. as in art. 219. Then turn the globe till the given body comes to the eastern part of the horizon, and the index shows the time of its rising; and the arc of the horizon between the body and the north or south points, will give its azimuth. Bring the body to the meridian, and the index shows the time of its coming to it. Bring the body to the western horizon, and the index shows the time of its setting; and the arc of the horizon between the body and the north or south points, will give its azimuth. You may thus find the time of the sun's rising and setting. If you turn the globe about its axis, all those stars which do not descend below the horizon, never set at that place; and those which do not ascend above it, never rise.

222. *To explain, in general, the Alteration of the Lengths of the Days, and the Difference of the Seasons.*

Put patches upon the ecliptic from aries both ways to the tropics, and let them represent so many different situations of the sun; and then the globe being rectified to the latitude of the place (by art. 208.), turn it about and you will see, for *north* latitude, that as the patches approach the tropic of cancer, the corresponding diurnal arcs will increase; and as the patches approach the tropic of capricorn, the diurnal arcs will decrease; also, the former arcs are greater than a semicircle, and the latter less; and the patch in the equator will describe a semicircle above the horizon. When therefore the sun is in the equator, the days and nights are equal; as he advances towards the tropic of cancer, the days increase, and the nights decrease, till he comes to the tropic, where the days are found to be longest, and the nights shortest; then as he approaches the equator, the length of the days diminishes and that of the nights increases, and when the sun comes to the equator, the lengths of the days and night are equal. Then as he advances towards capricorn, the days continue to diminish and the nights increase till he comes to that tropic, where the days are shortest and the nights are longest; and then as he approaches the equator, the days increase and the nights diminish; and when he comes to the equator, the days and nights are equal. And whatever be the latitude, when the sun is in the equator, days and nights are equal. To an inhabitant at the pole, the sun will appear to be half a year above the horizon, and half a year below. To an inhabitant at the equator, the days and nights will appear to be always equal; also, all the heavenly bodies will be found to be as long above the horizon as below. At the arctic circle, the longest day will be found to be 24 hours, and the longest night 24 hours; this appears by rectifying the globe to that latitude, and observing the patches at the tropics of cancer and of capricorn. Lastly, it will be found that all places enjoy equally the sun in respect to time, and are equally deprived of it, the length of the days at one time of the year being found exactly equal to the length of the nights at the opposite season. This appears by putting patches upon the ecliptic at opposite points of it.

223. *To find the Latitude and Longitude of a given Star; also, the Distance of two Stars.*

Bring the solstitial colure to the meridian, and fix the quadrant of altitude over the pole of the ecliptic; then turn the quadrant over the given star, and the arc

contained

contained between the ſtar and the ecliptic will be the *latitude*, and the degree on the ecliptic cut by it will be the *longitude*. The diſtance of two ſtars may be found, by laying the quadrant of altitude over both, and counting the degrees between.

224. *To explain the Phænomena of the Harveſt Moon.*

Rectify the globe for any northern latitude, for inſtance, that of *London*; and as the moon's orbit makes but a ſmall angle with the ecliptic, let us ſuppoſe the ecliptic to repreſent the moon's orbit. Now, in September, when the ſun is in the beginning of *libra*, if the moon be then at its full, it muſt be in the beginning of *aries*; and as the mean motion of the moon is about 13° in a day, put a patch on the firſt point of aries, and another 13° beyond it on the ecliptic; bring the former patch to the horizon, and then turn the globe till the other comes to it, and the motion of the index will ſhow about 17′, which is the difference of times of the moon's riſing on two ſucceſſive nights, becauſe the earth muſt make ſo much more than a revolution in time, before it overtakes the moon the next night. This ſmall difference ariſes from the ſmall angle which the orbit of the moon makes with the horizon. If you continue patches at every 13° till you come to *libra*, you will find the difference of the times of riſing will increaſe up to that point, and there the difference will be about 1h. 17′; and this point of the ecliptic, when it riſes, makes the greateſt angle with the horizon. Hence, when the moon comes to the firſt point of aries, there will be the leaſt difference of the times of her riſing, and this happens at the time of the full moon, when the full moon happens about the 21ſt September. That point of the ecliptic which riſes at the leaſt angle with the horizon, will be found to ſet at the greateſt, and therefore when there is the leaſt difference in the times of riſing, there will be found to be the greateſt in the times of ſetting.

On the Diviſion of Time.

225. The revolution of the earth about the ſun divides time into aſtronomical *years*; the revolution of the moon about the earth divides it into aſtronomical *months*; and the rotation of the earth about its axis divides it into aſtronomical *days*; theſe, which are alſo called *natural* days, include a common day and night. Theſe natural days are ſubdivided by clocks into *hours*, *minutes*, and *ſeconds*. The firſt object in the regulation and diviſion of time, is to keep the ſame ſeaſons to the ſame months, ſo that the middle of ſummer may happen towards the end of June, and the middle of winter towards the end of December. But before the ſun's motion was tolerably well known, it was not eaſy to accompliſh this. Some of the ancients formed a *lunar* year, conſiſting of 12 ſynodic lunar months, or 354 days, at the end of which they made their year begin again. But finding that this year would not agree with the ſeaſons, to correct it, they firſt added a month every three years; afterwards, 3 months every eighth year; and laſtly, 8 months every 19 years. Theſe were called *luni-ſolar* years, and were uſed by the *Jews* and *Romans*. The *Egyptian* year conſiſted of 365 days; they had 12 months of 30 days each, and then they added 5 days more. The year which *Numa* introduced amongſt the *Romans* was the luni-ſolar year, adding to the lunar year of 354 days, 22 days every two years, inſerting them as an intercalary month, after February every other year. But through the ignorance or negligence of the *Prieſts*, who had the care of theſe matters, the corrections, called intercalations, neceſſary for preſerving the agreement between the luni-ſolar year and the ſeaſons, were either omitted, or ſo improperly applied, as to produce great diſorders in the Roman calendar. Therefore JULIUS CÆSAR, to whom, when *Pontifex Maximus*, the care of theſe things belonged, reſolved to prevent, as far as he could, the like errors for the future. Accordingly, after having reſtored all their feſtivals to their proper ſeaſons, he, by the aſſiſtance of SOSIGENES, an aſtronomer of *Alexandria*, cauſed the old luni-ſolar year of NUMA to be entirely laid aſide, and ſubſtituted, inſtead thereof, the *Egyptian* ſolar year of 365 days, with the correction of an additional day every four years, it having been found that the true *tropical* year, by which the ſeaſons are governed, exceeds 365 days by ſix hours. This is called the *Julian* year. To add a day every fourth year, he cauſed the twenty-fourth day of February, which was the ſixth (ſextus) of the calends before March, to be reckoned twice. Hence, this year was called *biſſextile*, and it is now called *leap-year*. In our calendar, this day is added every fourth year to the end of February. This civil year immediately came into uſe throughout all Europe.

226. But time ſhewed that this correction was not accurate; for it was found, that the equinoxes and ſolſtices happened earlier by ſome days than they did in former diſtant years; and more accurate obſervations of the ſun diſcovered that the true tropical year was not 365d. 6h. but 365d. 5h. 48′ 48″. The tropical year was therefore thought to be longer than it really was, by 11′. 12″, which, in 129 years, would amount to a whole day, and cauſe the equinoxes to fall ſooner by one day; and therefore the middle of ſummer and the middle of winter would fall one day ſooner. A further correction therefore became neceſſary.

227. Pope GREGORY XIII. therefore ſet about the correction, from a deſire that the moveable feaſt of Eaſter ſhould happen as nearly as poſſible at the ſame times of the year reſpectively, with thoſe at which it had been kept for ſome years after the general council at *Nice*, which was holden in the year 325. But this could not be corrected without affecting the civil year in ſuch a manner, that the vernal equinox ſhould then, and at all future times, fall on, or as nearly as poſſible to, March 21, as it did at that general council, but which had then anticipated 10 days. For this purpoſe, he cauſed 10 days to be dropped in October 1582, and by this means the vernal equinox was reſtored to March 21. And having conſulted with the aſtronomers, he ordered that three ſucceſſive centenary years, which, according to the *Julian*

lian account, would have been *bissextiles*, should he common years, but that every fourth centenary year should be, as it otherwise would have been; a *bissextile* year. By this means, the difference between the *civil* and *tropical* accounts for the space of 400 years, will not differ so much as two hours, and will not amount to a whole day in less than 5082 years, at the end of which time it will be necessary to make a correction for this day. The civil year, thus corrected, took place in most parts of *Europe* many years ago, but it did not take place in *England* till the year 1752, at which time a correction of 11 days was made, that being then necessary, and the *third* of September was called the *fourteenth*. This is called by us the *new style*, and that in use before, or the *Julian* account, is called the *old style*. As leap year happens every fourth year, and every hundredth year was a leap year in the *Julian* account, therefore every year which is divisible by four, became a leap year. Now these centenary years, which, in the *Gregorian* account, are not to be leap years, are 1700, 1800, 1900, 2100, 2200, 2300, 2500, &c. Therefore, as the year 1700 happened between the time of the correction by GREGORY, and that made by us, the *Gregorian* account had left out one day in that year which the *Julian* had not; therefore the *Gregorian* account having, at the time it took place, left out 10 days, we were obliged to leave out 11 days, to bring our account to agree with that.*

228. Amongst different nations, the *beginning* of the year varied as well as the *length*. The *Jews* began their ecclesiastical year with the new moon of that month, whose full moon happened next after the vernal equinox. The *church of Rome* begin their year on the Sunday which falls on the said full moon, or that happens next after it; or on Easter Sunday. The *Jews* began their *civil* year with the new moon which has its full moon happening next after the autumnal equinox. The *Grecians* began their year with the new moon which happened next after the summer solstice. The *Romans*, according to PLUTARCH, began their year at March, from the time of ROMULUS to NUMA, who changed the beginning to January. ROMULUS made the year consist of only ten months, as appears from the name of the last, *December*, or the tenth month; and that *March* was the first is evident, because they called the fifth from it *quintilis*, the sixth *sextilis*, and the rest in their order. The first month of the *Egyptian* year began on our August 29. The *Arabic* and *Turkish* year began on July 16. The *ancient Clergy* made March 25, the beginning of the year.

229. The first division of the civil year is into civil *months*, of which there are twelve. These cannot be of an equal length, because the number of days in a year is not divisible by 12. There are therefore in every year, *seven* months of 31 days each, *four* of 30 days each, and in the common years *one* of 28 days, but which contains 29 in every leap year. These are the months used for civil purposes. But the space of 28 days is also called a month, and it is by the division of this into four equal parts, that the year is subdivided into weeks, each consisting of seven days. Hence, a common year consists of 13 of these months, or 52 weeks and 1 day, and a leap year of the same, and 2 days.

230. The days into which the civil year is divided, are called *natural*, and contain 24 hours. But there is a day called *artificial*, which is the time from sun-rise to sun-set. The natural day is either *astronomical* or *civil*. The astronomical day begins at noon. The *British*, *French*, *Dutch*, *Germans*, *Spaniards*, *Portuguese*, and *Egyptians*, begin the civil day at midnight; the ancient *Greeks*, *Jews*, *Bohemians*, and *Silesians*, began it at sun-setting, as do the modern *Italians* and *Chinese*; and the ancient *Babylonians*, *Persians*, *Syrians*, and modern *Greeks*, at sun-rising. The *Jews*, *Chaldeans*, and *Arabians*, divide the hour into 1080 equal parts, called *scruples*.

231. The points of time from which historians begin to reckon, are called *epochs*, or *æras*, and generally arise from some remarkable event. The first *æra* is the *Creation of the World*. Historians differ a little in their estimation of this time, making it from 3950 to 4000 years before CHRIST. The *æra* of the *Olympiads* is the most famous of the profane ones, which is placed 776 years before CHRIST, and this the *Romans* used. The *æra* of *Nabonassar* was 747 years before CHRIST, from which time the *Chaldeans* and *Egyptians* reckoned their years. The *æra* we use is called the *Christian æra*, because it began at the birth of CHRIST; not indeed on the very day that he was born, which is reckoned on 25th of December, but 7 days after, on January 1st the next year. The *æra* of the *Julian* year was 45 years before this, when JULIUS CÆSAR rejected the old *Roman* year, and ordered the *Julian* year to be observed all over the Roman empire. The *Turkish æra* is the *Hegira*, or *flight of Mahomet*, 622, A. C. The *Persian æra* is called *Yesdegird*, 631 A. C.

232. But besides the measures of time by *years*, &c. it was found convenient to introduce the use of *cycles*, that is, a circulation of time between the return of the same event. The *cycle of the sun* is the space of 28 years, in which time the days of the months return again to the same days of the week, and the sun's place to the same degrees of the ecliptic on the same days, so as not to differ 1° in 100 years; and the leap years return again in respect to the days of the week on which the days of the month fall. These things arise from hence: If 365 (the days in a common year) be divided by 7, there remains 1, which shews that the last day of the year is the same as the first, that is, if the first be on the Monday the last is on the Monday. Now it is customary to place against the seven days of the week, the first seven letters of the alphabet, A, B, C, D, E, F, G, placing A always against the first day of the year, and therefore as they were continued through the year, the same letter A must stand against the last day. Hence, if the *first* of January be a *Sunday*, and A stands against it, A points out every Sunday in the year. But as the

* As the year 1800 was a common year, there is now 12 days difference between the *new* and *old* style.

first

first day of the next year is a *Monday*, against which A stands, G will stand against the first Sunday, and therefore against every Sunday in that year. For the same reason, the first day of the next year is *Tuesday*, and being marked with A. F will stand against every Sunday in the year, and so on. Therefore the *Sunday letters* will come on in an inverted order, A, G, F, E, D, C, B, in the successive years; hence, these are called *dominical* letters. This would be the case, if there were no leap year or years, of 366 days; when this happens, the additional day thus taken is marked with the same letter, which necessarily throws the Sunday letter one letter back for the rest of the year. Hence, in leap years there are two *dominical letters*, the first takes place before February 29, the second after. As therefore the regular change of the Sunday letter, which would be completed in 7 years, is thus interrupted every four years, the whole change will be completed in 7×4, or 28 years. But this will be sometimes interrupted, because every three centenary years out of four, are not leap years. The year of our Saviour's birth was the 9th of this cycle; therefore, to find the year of this cycle, add nine to the given year, and divide the sum by 28, and the quotient shews the number of cycles elapsed since his birth, and the remainder is the cycle for the year; if nothing remains, the cycle is 28.

233. The *cycle of the moon*, sometimes called the *Metonic cycle* from the inventor *Meton*, is a period of 19 years, in which times the conjunctions, oppositions, and all other aspects of the moon, return on the same days of the month as they did 19 years before, but about 1¼ hour sooner. The ancients formed this cycle thus: Taking any year for the cycle, they observed all the days on which the new moon happened through the year, and against each such day they placed the number 1; in the second year of the cycle they did the same, placing the number 2; and proceeded in like manner through the cycle of 19 years. This being done for one cycle, the same numbers were fitted to the calendar, to shew the new moons in every future cycle; and on account of their great use, they were written in *gold*, and thence called *golden numbers*. But the difference of about 1¼ hour in 19 years increases to a whole day in about 312 years, so that this cycle can only hold for that time: for as the new and full moons anticipate a day in that time, the golden numbers ought to be placed one day earlier in the calendar for the next 312 years. It was thought proper, however, to make this correction at the end of whole centuries; accordingly they put the new moon forward one day at the end of every 300 years, for seven times successively, which makes 2100 years; and to account for the odd 12½ years, they deferred putting the moon forward to the end of 400 years, making the period of 8×312½=2500 years. The golden numbers were properly placed by the council of *Nice*, A. D. 325; the anticipation, which has been neglected ever since, is now become almost 5 days, and therefore all the golden numbers ought now to be placed 5 days higher in the calendar for the *old style*, than they were at the above-mentioned council; or 6 days lower for the *new style*. But because the lunar cycle of 19 years sometimes includes 4 and sometimes 5 leap years, it is impossible to have a correct table of all the numbers, unless it be extended to 4×19, or 76 years. And in this case it must be adapted to the *old style*, because in every centenary year not divisible by 4, the regular course of the leap year is interrupted in the *new style*. The year of our Saviour's birth was the first year of the lunar circle; hence, to find at any time the cycle for the year, add one to the given year of CHRIST, and divide the sum by 19, and the quotient is the number of cycles since the time of CHRIST, and the remainder is the cycle for the given year, or the *golden number*, and if nothing remain, 19 is the cycle.

234. The *epact* is the moon's age in days, at the beginning of the year. Let a new moon happen on January the 1st, then the epact is nothing. Now, as 12 lunations are completed in 354 days, it is plain that the epact, or moon's age, would be 11 at the beginning of the second year; 22 at the beginning of the third year; and 33 at the beginning of the fourth; but as one lunation is never more than 29½ days, the epact must always be less than 30; therefore subtracting 30 from 33, there remains 3 for the epact for the fourth year. And by proceeding thus for 19 years, the epacts will stand thus: 0, 11, 22, 3, 14, 25, 6, 17, 28, 9, 20, 1, 12, 23, 4, 15, 26, 7, 18, 0; in the nineteenth year, the difference amounts to 29 days, and therefore the month which is subtracted must consist only of 29 days, in order that the epact may begin again, as it must, the new moon falling on January 1st. These epacts being placed against the days of the months in the calendar, on which the new moons fall in each year, answer the same purpose as the golden numbers. But it is liable to be interrupted every 310 years, for the same reason, the moon having then anticipated a whole day, and therefore on the first year of the cycle, the moon would be one day old on the 1st of January; therefore the epact would be increased by 1, and stand thus, 1, 12, 23, 4, &c. But this arrangement would be interrupted by the omission of the leap year every three centuries out of 4; for these years being a day less than by the *Julian* account, the new moons would happen a day later, and therefore make the epact 1 less. The moon's age here supposed is the *mean* new moon, that is, the new moon that would happen, if the moon moved uniformly with its mean velocity; but as the moon's motion is variable, the *true* new moon happens at a different time, and may sometimes differ a day, that is, one may fall in one day, and the other in the next day. According to the rule therefore by which we find Easter, that festival is not always found to agree with the time deduced from the new moon, as put down in our almanacs, for there the time of the *true* new moon is put down; whereas, in the rule, for finding Easter, the *mean* new moon is used. In the correction of the British calendar, we use the golden numbers, omitting the epacts; and have placed the golden numbers, not against the days of the new moon, but

but of the full moon, and only against the full moons in the paschal months, March and April, in order to find Easter.

235. The *indiction* is a cycle of 15 years, and was used by the Romans for indicating the times of certain payments, made by the subjects to the republic, and was established by CONSTANTINE in the year 312. Why it was confined to 15 years, or on what occasion it was instituted, are not known. If we subtract 312 from the given year, and divide the remainder by 15, what remains is the indiction for the given year; and if nothing remain, the indiction is 15.

236. The *Cycle of Easter*, called the *Dionysian Period*, is the product of the *solar* and *lunar* circles of 28 and 19 years = 532 years. If the new moons did not anticipate upon this circle, as in art. 233, *Easter-day* would always be the Sunday next after the first full moon which follows March 21. But on account of that anticipation before the alteration of the stile, the *Ecclesiastical Easter* happened, within this century, a week different from the *true Easter*. But this is now remedied in the *Common Prayer-Book*, by making the table, which used to find *Easter for ever*, of no longer use than the lunar difference will admit of.

237. The *earliest* Easter is March 22, and the *latest* is April 25; for *Easter Sunday* is always the first Sunday after the full moon, which happens upon or next after March 21st. Within these limits there are 35 days, and the number belonging to each is called the *number of direction*.

On the Nature and Use of Maps.

238. A map is the representation of the surface of the earth upon a plane; and these are either *general* or *particular*. A general map, is a map of the whole earth, and this is represented in two circles touching each other, representing two hemispheres of the earth, the boundaries of which are meridians. A particular map, is a map of only a part of the surface of the earth, as of one of the quarters of the world, or of any particular country. The laying down of these maps is called *projection*, of which there are several kinds.

239. In maps, three principal things are required. 1st. To shew the latitude and longitude of places; and this is done by drawing a certain number of meridians, and parallels of latitude. 2d. The second requisite is, to exhibit, as nearly as you can, the shape of all the countries, for it cannot be done accurately by any projection, on account of its being made on a plane, when the earth is globular. 3d. The third is, to show the bearings of places from each other, and their distances; the former can be done in one projection, but the latter cannot.

240. The projection of maps is made according to the rules of perspective. If the eye be supposed to view the earth from an infinite distance, the appearance represented upon a plane is called an *ortographic* projection. In this case, the parts about the middle are very well represented, but the extreme parts are very much contracted. But the method generally made use of by geographers for maps, is the *stereographic*, where the eye is supposed to be on the surface of the earth, and looking at the opposite hemisphere. There is also a projection called *globular*, in which meridians, equidistant upon the surface of the earth, are represented by equidistant circles in the map. There is also another projection, used by navigators, called *Mercator's*, in which, both the meridians and parallels of latitude are represented by straight lines. These are called *sea charts*, wherein are exhibited some part of the sea, with the shores that bound it; the islands are generally omitted, as being of no use to the sailor; but the parts near the shore are carefully laid down, with marks signifying rocks, sands, or flats, and figures expressing the *soundings*, or depths of the water. The accurate method of constructing all kinds of maps, may be seen in the Treatise of Astronomy before referred to.

241. When we are to delineate a map of a *small* part of the earth, if it be near the equator the meridians and parallels of latitude may be represented by equidistant straight lines. If at some distance from the equator, the meridians must then be made to converge a little, and the more so, the further you recede from the equator.

242. When a map is made of a *very small district* as of a county, on whatever part of the earth it is, the meridians and parallels of latitude may be represented by equidistant parallel lines.

243. A line which cuts all the meridians at the same angle, is called a *rhumb* line; as long therefore as a ship sails upon the same rhumb, it sails upon the same point of the compass. When the projection of the meridians is by circles, then the rhumb line is a curve; but when the meridians are represented by straight and parallel lines, the rhumb becomes a straight line, it being the property of a straight line to cut parallel straight lines in the same angle.

244. Hence the great use of *Mercator's* Chart, which is constructed upon this principle. Upon the earth's surface, the degrees of latitude are all equal, but the degrees of longitude decrease as you approach the poles, as we have explained in art. 10. Now in this projection, the meridians being equidistant straight lines, the degrees of longitude must be every where equal; in order therefore to preserve the proper proportion between the degrees of longitude and latitude, the degrees of latitude are increased in a proper proportion; the degrees of latitude therefore increase as you go from the equator to the pole. Now in sailing from one place to another, the shortest way is to sail upon a great circle, but that is a thing which is impracticable, there being nothing to direct you in such a course. Navigators therefore, when they have to go from one place A to another B, find upon what rhumb they must sail, that is, upon what point of the compass they must go, so as to come to B, and by their steering compass they can tell when they sail on the same point. Now on *Mercator's* projection, if you draw a straight line from A to B, it gives

gives you the rhumb required; for in these maps, there is a point assumed, and from it there are drawn 32 straight lines to the 32 points of the compass; when therefore you draw the straight line from A to B, you must observe to which of the 32 lines it is parallel, or to which it is nearest so, and you thus get the rhumb, or the point of the compass you must continue to sail upon, in order to go from A to B. For instance, if you find the line A B is parallel to the south-west line of the compass, then if you continue to sail on the south-west point, you must come to B.

245. In all maps, the upper part is northern, the lower part southern, the right hand side is eastern, and the left hand side is western. On the right and left sides, the degrees of *latitude* are marked; and on the top and bottom, the degrees of *longitude* are marked. When the maps are very large, the degrees may be subdivided into halves, quarters, &c.

246. When the meridians and parallels of latitude are *straight and parallel lines*, the *latitude* of a place is found by stretching a thread over the place, so that it may cut the *same* degree of latitude on the right and left side of the map, and that degree is the latitude of the place. And to find the *longitude*, stretch a thread over the place, so that it may cut the *same* degree of longitude on the top and bottom, and that degree is the longitude of the place. For instance, if we take the chart of the East India islands, and stretch a string over *Siam*, we shall find that it will cut each side at 14° N. lat. and the top and bottom at 100°. 10′ E. long. These therefore are the latitude and longitude of that place.

247. On the contrary, if the latitude and longitude of a place be given to find the place, stretch one thread over the given degree of latitude on each side, and another thread over the given degree of longitude at the top and bottom; and at the intersection of the threads is the place required. By this means you may put down in a map, any place whose latitude and longitude are known.

248. Now let the meridians and parallels of latitude be *curve lines*. Then to find the *latitude* of a place, a parallel of latitude must be drawn through it, by the same rules as the other parallels are drawn, and it cuts the sides at the degree of latitude of the place. And to find the *longitude* of the place, draw a circle of longitude through it, by the same rules as the other circles are drawn, and it cuts the top and bottom at the degree of longitude of the place. But as it is troublesome to draw these circles, the following method may generally be sufficiently accurate. To find the *latitude*, find by a pair of compasses and a scale of equal parts, how far the place is from the two parallels between which it lies, and divide the distance of the parallels in that proportion, and you get very nearly the latitude. Suppose, for instance, the distance between the parallels to be 5°, and that one is a parallel of 45°, and the other of 50°; and suppose the place to be within 3 parts of the parallel of 45°, and 7 parts of the parallel of 50°; then 5° must be divided into 10 parts, and 3 of those parts must be added to 45°, and it gives the latitude. This is done by proportion, thus, 3+7, or 10 : 3 :: 5° : $\frac{3\times 5^\circ}{10} = \frac{15^\circ}{10} = 1\frac{1}{2}^\circ$; therefore the latitude is $46\frac{1}{2}^\circ$ nearly. In the very same manner you may find the *longitude* nearly.

249. On the contrary, if the latitude and longitude of a place be given, to find the place, draw a circle of latitude through the given latitude on each side, and a circle of longitude through the given longitude at the top and bottom, and their intersection denotes the place. Or as you know between what two parallels of latitude and of longitude the place is, you know by what four lines it is bounded; and as you know the proportional distance from each line, you may easily, by trial, find the point.

250. When we undertake a voyage, we ought to be acquainted with the islands, rocks, sands, straits, rivers, &c. near which we are to sail; the windings and the runnings out of the shores, &c. we should also know the signs of being near land, which are, frequently, by the appearing of birds; the floating of weeds upon the sea; the depth and colour of the water. Moreover, we should know the times when the winds set in, particularly the trade winds or monsoons: the seasons when storms and hurricanes are to be expected, and the signs of their approach; the motions of currents; but more especially of the tides. All these things are to be learned by good sea-charts, and journals of voyages.

On the Mariner's Compass.

251. The earth possesses a ferruginous substance which has the property of attracting iron and steel only, and this substance is called a *natural magnet* or *loadstone*. The same property may also be communicated to iron and steel, and these are called *artificial magnets*.

252. If a piece of wire, or a needle be rendered magnetic, and be suspended upon a fine point at its middle, so that it can freely turn in an horizontal plane, one end will always be directed towards the northern part of the horizon, and the other towards the southern. The former end is called the *north pole*, and the latter end the *south pole*. These poles are not directed to the north and south poles of the earth, but vary considerably from them, and differently in different places, and this is called the *variation of the compass*; and even in the same place, they are subject to a very small gradual variation. The direction in which the magnet stands, is called the *magnetic meridian*.

253. The *mariner's compass*, or, as it is called, the *compass*, the *steering compass*, or the *needle*, consists of three parts, the box, the card or fly, and the needle. The card is a circle of stiff paper representing the horizon, with the 32 points of the compass marked upon it; the magnetic needle is fixed to the under side of this card; the centre of the needle is perforated, and a cap with a conical agate at its top is fixed in this perforation; this cap is hung on a steel pin, which is fixed to the bottom of

of the box, so, that the card, hanging on the pin, turns freely round its centre, and the needle lies in the direction of the N. and S. points of the card, and therefore these points will always be directed to the *magnetic* north and south points of the horizon, the needle fixing itself in the *magnetic* meridian. The box which contains the card and needle, is a circular brass box, hung within another box by two concentric rings, called jimbals, so fixed by cross centres to the two boxes, that the inner one shall retain a horizontal situation in all the motions of the ship. The top of the inner box has a cover of glass, to prevent the card from being disturbed by the wind.

254. In order to determine the true point of the compass on which a ship sails it is necessary to know the *variation* of the compass at the place where you are, on which account, every means have been used to determine, by observation, what the variation is; and these observations have been put down in good sea-charts, for the use of navigators. These however can serve but for a few years, on account of their being variable at the same place; nor has it been discovered how much the variation is subject to vary. The following table from Mr. CAVALLO's Treatise on Magnetism, contains the variation at the places and times therein inserted, and upon many occasions may be found very useful.

Latitude N.	Longitude W.	Variation E.	Years.
70°. 17′	163°. 24′	30°. 21′	1779
69. 38	164. 11	31. 0	1778
66. 36	167. 55	27. 50	
65. 43	170. 34	27. 58	
63. 58	165. 48	26. 25	
59. 39	149. 8	22. 54	
58. 14	139. 19	24. 40	
55. 12	135. 0	23. 29	
53. 37	134. 53	20. 32	
50. 8	4. 40	Variation W.	
48. 44	5. 0	20. 36	1776
40. 41	11. 10	22. 38	
33. 45	14. 50	22. 27	
31. 8	15. 30	18. 7	
28. 30	17. 0	17. 43	
23. 54	18. 20	14. 0	
		15. 4	
20°. 30′	20. 3′	14°. 35′	
19. 45	20. 39	13. 11	
16. 37	22. 50	10. 33	
15. 25	23. 36	9. 15	
13. 32	23. 45	9. 25	
12. 21	23. 54	9. 48	
11. 51	24. 5	8. 19	
8. 55	22. 50	8. 58	
6. 29	20. 5	9. 44	
4. 23	21. 2	9. 1	
3. 45	22. 34	8. 27	
2. 40	24. 10	7. 42	
1. 14	26. 2	5. 35	
0. 51	27. 10	4. 59	
0. 7	27. 0	4. 27	
Latitude S.			
1. 13	28. 58	3. 12	

Latitude S.	Longitude W.	Variation W.	Years
2°. 48′	27°. 37′	2°. 52′	1776
3. 37	30. 14	2. 14	
4. 22	30. 29	2. 54	
5. 0	31. 40	1. 26	
6. 0	32. 50	0. 6	
		Variation E.	
6. 45	33. 30	0. 35	
		Variation W.	
7. 50	34. 20	0. 7	
8. 43	34. 20	0. 15	
		Variation E	
9. 1	34. 50	0. 44	
		Variation W.	
10°. 4′	34. 49	0. 38′	
		Variation E.	
12. 40	34. 49	1. 12	
13. 23	34. 49	1. 1	
14. 11	34. 49	1. 9	
15. 33	34. 40	1. 45	
16. 12	35. 20	2. 4	
18. 30	35. 50	3. 2	
20. 8	36. 1	5. 26	
21. 37	36. 9	3. 24	
24. 17	36. 8	3. 24	
26. 47	34. 27	3. 44	
28. 19	32. 20	1. 58	
30. 25	26. 28	2. 37	
		Variation W.	
33. 43	16. 30	4. 44	
35. 37	9. 30	5. 51	
38. 52	23. 20	22. 12	
	Longitude E.	Variation E.	
40. 36	171. 34	13. 47	
42. 4	167. 32	13. 17	
		Variation W.	
44. 52	155. 47	9. 21	
46. 15	144. 50	14. 48	
48. 41	69 0	7. 39	

Variation

Variation observed at London at different Times.

Years.	Variation.	
1576	11°. 15′	East.
1580	11. 11	East.
1612	6. 10	East.
1622	6. 0	East.
1633	4. 5	East.
1634	4 5	East.
1657	0. 0	East.
1665	1. 22½	West.
1666	1. 35½	West.
1672	2. 30	West.
1683	4. 30	West.
1692	6. 0	West.
1700	8. 0	West.
1717	10. 42	West.
1724	11. 45	West.
1725	11 56	West.
1730	13. 0	West.
1735	14. 16	West.
1740	15. 40	West.
1745	16. 53	West.
1750	17. 54	West.
1760	19. 12	West.
1765	20. 0	West.
1770	20. 35	West.
1774	21. 3	West.
1775	21. 20	West.

255. The present variation at London is about 24°, and is increasing. The change of variation is not sufficiently regular, so as to be able to ascertain at any future time, what the variation will be.

256. The magnet is subject to a *daily* variation, which is effected by heat and cold, as appears by the following observations, made by Mr. CANTON.

The Variation observed at different Hours of the same Day, July 27, 1759.

	Hour.	Min	Variation W		Thermo.
Morning	0.	18	18°.	2′	62
	6.	4	18	58	62
	8.	30	18.	55	65
	9.	2	18.	54	67
	10.	20	18.	57	69
	11.	40	19.	4	68½
Afternoon	0.	50	19.	9	70
	1.	38	19.	8	70
	3.	10	19.	8	68
	7.	20	18.	59	61
	9.	12	19.	6	59
	1[illegible].	40	18.	51	57½

The mean Variation for each Month in the Year.

January	7′.	8″
February	8.	58
March	11.	17
April	12.	26
May	13.	0
June	13.	21
July	13.	14
August	12.	19
September	11.	43
October	10.	36
November	8.	9
December	6.	58

By this table it appears, that the variation of the needle is greatest in summer, and least in winter.

257. Dr. HALLEY first published some variation charts, from observations made at the beginning of the present century. Another chart was afterwards formed by MOUNTAINE and DODSON, upon observations made in 1756. These charts are thus constructed. On a general map of the world, mark down with dots, all the places in which the variation is the same, and then draw a line through all these points: thus, mark down with dots, every place which has 20° east variation, and draw a line through all these dots, and you get the line of 20° east variation. Where the dots are at a considerable distance, you must fill the space up with a line which seems most to accord with the tendency of the line on each side. In Dr. HALLEY's chart, the line of no variation crosses the meridian of *London*, at about the 55° of south latitude; it then proceeds in an arched manner towards the west of the said meridian, and increasing its curvature as it advances into the northern hemisphere, terminates at *Charles-Town* in *North America*. In the *Indian* sea, the lines of variation are very irregular.

258. The method of finding by the compass, the direction in which a ship sails, is this: the compass is suspended in the cabin, and you look horizontally over the compass in the direction of the ship's wake, by which you see the point of the compass denoting the direction of the wake, the opposite point to which, is the point to which you are sailing, according to the compass; and knowing how much the compass varies, you can tell the true point of the horizon to which you are going.

259. If a magnet be suspended by an horizontal axis, so that it can freely move in a vertical plane, it will not stand in an horizontal position, although the two ends be accurately balanced, but the north end of the magnet, in this part of the world will incline towards the horizon, or *dip*, as it is called, and of course the south pole will be elevated. An instrument thus constructed is called *a dipping needle*. As you approach the southern parts of the earth, the dip will diminish, and at length the magnet will become horizontal; and proceeding more

more southerly, the south end will dip. The following table shows the dip at the places and times there noted. By the dip, we mean the angle which the magnet makes with the horizon.

Latitude N.		Longitude E.		North End Dips.		Years.
53°.	55′	193°.	39′	69°.	10	1778
49.	36	233.	10	72.	29	
		Longitude W.				1776
44.	5	8.	10	71.	34	
38.	53	12.	1	70.	30	
34.	57	14.	8	65.	12	
29.	18	16.	7	62.	17	
24.	24	18.	11	59.	0	
20.	47	19.	36	56.	15	
15.	8	23.	38	51.	0	
12.	1	23.	35	48.	26	
10.	0	22.	52	44.	12	
5.	2	20.	10	37.	25	
Latitude S.						
0.	3	27.	38	30.	3	
4.	40	30.	34	22.	15	
7.	3	33.	21	17.	57	
11.	25	34.	24	9.	15	
		Longitude E.		South End Dips.		
16.	45	208.	12	29.	28	
19.	28	204.	11	41.	0	
21.	8	185.	0	39.	1	1777
35.	55	18.	20	45.	37	1774
41.	5	174.	13	63.	49	1777
45.	47	166.	18	70.	5	1773

260. In the same place, the dip is subject to a variation; it is now about 72° at *London*, and from the most accurate observations on the dipping needle belonging to the Royal Society, it appears to diminish about 15′ in 4 years. In going from north to south, the dip does not alter regularly. As it is extremely difficult to balance the needle accurately, the poles of the needle are generally reversed by a magnet, so that its two ends may dip alternately, and the mean of the two dips is taken.

261. A bar of iron which stands for some time in a vertical position, will acquire a degree of magnetism; from which, and the phænomena of the *compass* and *dipping needle*, there can be no doubt but that the cause exists in the earth. Dr. HALLEY supposed that the earth has within it a large magnetic globe (not fixed within to the external parts), having four magnetic poles, two fixed and two moveable, which will account for all the phænomena. This would make the variation subject to a constant law; whereas we find casual changes which cannot be accounted for upon this hypothesis. This the Doctor supposes may arise from an unequal and irregular distribution of the magnetic matter. The distribution also of the ferruginous matter in the shell, may cause some irregularities. The *Aurora Borealis* has been observed to have an effect upon the *needle*; and it is a remarkable circumstance, that the magnetic meridian is directed to the centre of the aurora borealis. Mr. DALTON, in his *Meteorological Observations and Essays*, has deduced the following conclusions from his observations. 1st, When the *aurora* appears to rise only about 5°, 10°, or 15°, above the horizon, the disturbance of needle is very little, and often insensible. 2d, When it rises up to the zenith, and passes it, there never fails to be a considerable disturbance. 3d, This disturbance consists in an irregular oscillation of the horizontal needle, to the eastward and westward of the mean daily position; and in this place (*Kendal*) the excursions on each side are about half a degree. 4th, When the aurora ceases, or soon after, the needle returns to its former station. It appears from hence, that there is something magnetic in the higher parts of the atmosphere.

262. Mr. DALTON has also given us the following observations respecting the effects which the *aurora borealis* has on the weather. Since the spring of 1787, there have been 227 *auroræ* observed at *Kendal* and *Keswick*; 88 of the next succeeding days were *wet*, and 139 *fair*, at *Kendal*, now in the account of rain, the mean yearly number of *wet* days is 217, and of *fair* days 148; hence, the chances of any one day, taken at random,

dom, being *wet* or *fair*, are as those numbers. But it appears that the proportion of *fair* days to *wet* ones succeeding the *aurora*, is much greater than this general ratio of *fair* days to *wet* ones: the inference therefore is, that the appearance of the *aurora borealis* is a prognostication of *fair* weather.

263. It may perhaps be here objected, that as the *aurora* can only be seen in a clear atmosphere, this circumstance alone would render it probable that the next day would be fair; but upon examining the observations, it appears that the *aurora* not only favours the next day, but it also indicates that a series of days to the number of 10 or 12 are likely to be fair.

Of 227 observations, 139 were followed by 1 or more fair days, 100 by 2 or more &c. as under:

1	2	3	4	5	6	7	8	9	10	11	12
139	100	69	52	38	30	21	16	10	6	2	1

But according to the laws of chance, the series ought to have been if the aurora had no influence, as under:

1	2	3	4	5	6
92	38	15	6	2	1

From which it appears, that there should not have been above 1 *aurora* out of 227 followed by 6 *fair* days; and yet, in fact, there were 30. The aurora is more frequently followed by *fair* weather in summer than in winter.

On Winds.

264. Wind is a current of air, and its direction is denominated from that point of the compass *from* which it comes. The principal, if not the only cause of winds, is a partial rarefaction of the air by heat. When the air is heated, it becomes rarer, and therefore ascends; and the surrounding cold air rushing in to supply its place, forms a current in some one direction. Winds may be divided into *constant*, or those which blow always in the same direction; *periodical*, or those which blow half a year in one direction, and half a year in a contrary direction; these are called *monsoons*; and *variable*, which are subject to no rules. The two former are also called *trade winds*. We shall here give the principal phænomena of the winds, from Dr. HALLEY's account thereof in the *Phil. Transf.*

1st, In the *Atlantic* and *Pacific Ocean*, under the equator there is a constant east wind.

2d, To about 28° on each side of the equator, the wind on the *north* side declines towards the *north east*, and the more so, the further you recede from the equator; and on the *south* side it declines in like manner towards the *south east*. The limits of these winds are greater in the *Atlantic Ocean*, on the *American*, than on the *African* side, extending in the former case to about 32°, and in the latter to about 28°. And this is true likewise to the southward of the equinoctial; for near the *Cape of Good Hope*, the limits of the trade winds are 3° or 4° nearer the line than on the coast of *Brasil*.

3d, Towards the *Caribbee Islands*, the aforesaid north-east wind becomes more easterly, so as sometimes to be east, and sometimes east by south, but most northwards of the east, a point or two.

4th, On the coast of *Africa*, from the *Canaries* to about 10° N latitude, the wind sets in towards the north east; then it becomes south west, approaching more to the south, as you approach the *Cape*. But away from the coasts, the winds are perpetually between the south and the east; on the *African* side they are more southerly; on the *Brasilian*, more easterly, so as to become almost due east. Upon the coast of *Guinea*, they are subject to frequent calms, and violent sudden gusts, called *tornados*, from all points of the compass.

5th, In the *Indian* Ocean, the winds are partly *constant*, and partly *periodical*. Between *Madagascar* and *New Holland*, from 10° to 30° latitude, the wind blows south east by east. During the months of *May*, *June*, *July*, *August*, *September*, *October*, the aforesaid south east winds extend to within 2° of the equator; then for the other six months, the contrary winds set in, and blow from 3° to 10° S. latitude. From 3° south latitude over the *Arabian* and *Indian* seas and *Bay of Bengal*, from *Sumatra* to the coast of *Africa*, there is another *monsoon*, blowing from *October* to *April* on the north east point, and in the other half year from the opposite direction. Between *Madagascar* and *Africa*, a south south-west wind blows from *April* to *October*, which, as you go more northerly, becomes more westerly, till it falls in with the west south-west winds; but the Doctor could not obtain a satisfactory account, how the winds are in the other half year. To the eastward of *Sumatra* and *Malacca*, on the north side of the equator along the coast of *Cambodia* and *China*, the *monsoons* blow, and change at the same time as before mentioned; but their directions are more northerly and southerly. These winds reach to the *Philippine Islands*, and to *Japan*. Between the same meridians, on the south side of the equator, from *Sumatra* to *New Guinea*, the same monsoons are observed. The shifting of these winds is attended with great hurricanes.

265. The east wind about the equator is thus explained. The sun moving from east to west, the point of greatest rarefaction of the air, by the heat of the sun, must move in the same direction; and the point of greatest rarefaction following the sun, the air must continually rush in from the east, and make a constant east wind.

266. The constant north-east wind on the north side of the equator, and south-east wind on the south side, may be thus accounted for. The air towards the poles being denser than that at the equator, will continually rush towards the equator; but as the velocity of different parts of the earth's surface from its rotation, increases as you approach the equator, the air which is rushing from the north towards the equator will not continue upon the same meridian, but it will be left behind; that is in respect to the earth's surface, it will have a motion from the east, and these two motions combined, produce a north-

north-eaſt wind on the north ſide of the equator. And in like manner, there muſt be a ſouth-eaſt wind on the ſouth ſide. The air which is thus continually moving from the poles towards the equator, being rarefied when it comes there, aſcends to the top of the atmoſphere, and then returns back to the poles. This ſolution is given by Mr. HALLEY in the *Phil. Tranſ.* vol. 39.

267. The periodical winds are ſuppoſed to be owing to the courſe of the ſun northward and ſouthward of the equator. Dr HALLEY explains them thus: "ſeeing that ſo great Continents do interpoſe and break the continuity of the Ocean, regard muſt be had to the nature of the ſoil, and the poſition of the high mountains, which I ſuppoſe the two principal cauſes of the ſeveral variations of the winds from the general rule: for, if a country lying near the ſun prove to be flat, ſandy, low land, ſuch as the *Deſarts of Libya* are uſually reported to be, the heat occaſioned by the reflection of the ſun's beams, and the retention thereof in the ſand, is incredible to thoſe that have never felt it; whereby the air being exceedingly rarefied, it is neceſſary that the cooler and more denſe air ſhould run thitherward to reſtore the equilibrium. This I take to be the cauſe, why near the coaſt of *Guinea*, the wind always ſets in upon the land, blowing weſterly inſtead of eaſterly, there being ſufficient reaſon to believe, that the inland parts of *Africa* are prodigiouſly hot, ſince the northern borders thereof were ſo intemperate, as to give the ancients cauſe to conclude, that all beyond the *tropic* was made uninhabitable by exceſs of heat. From the ſame cauſe it happens, that there are ſo conſtant calms in that part of the Ocean called the *Rains*. For this tract being placed in the middle, between the weſterly winds blowing on the coaſt of *Guinea*, and the eaſterly trade winds blowing to the weſtwards therof, the tendency of the air here is indifferent to either, and ſo ſtands in equilibrio between both; and the weight of the incumbent atmoſphere being diminiſhed by the continual contrary winds blowing from hence, is the reaſon, that the air here holds not the copious vapours which it receives, but lets them fall in ſo frequent rains.

268. As the cold and denſe air, by reaſon of its greater gravity, preſſes upon the hot and rarefied, 'tis demonſtrative that this latter muſt aſcend in a continual ſtream as faſt as it is rarefied, and that being aſcended, it muſt diſperſe itſelf to preſerve the equilibrium, that is, by a contrary current, the upper air muſt move from thoſe parts where the greateſt heat is: ſo by a kind of circulation, the N. E. trade wind below, will be attended with a S. W. above, and the S. E. below with a N. W. wind above. And that this is more than a bare conjecture, the almoſt inſtantaneous change of the wind to the oppoſite point, which is frequently found in paſſing the limits of the trade winds, ſeems to aſſure us; but that which above all confirms this hypotheſis, is this, that the phænomenon of the monſoons is, by this means, moſt eaſily ſolved, and without it, hardly explicable. Suppoſing therefore ſuch a circulation as above, 'tis to be conſidered, that to the northward of the *Indian Ocean* there is every where land within the uſual limits of the latitude of 30°, viz. *Arabia*, *Perſia*, *India*, &c. which for the ſame reaſon as the mediterraneau parts of *Africa*, are ſubject to unſufferable heats when the ſun is to the north, paſſing nearly vertical, but yet are temperate enough when the ſun is removed towards the other tropic, becauſe of a ridge of mountains at ſome diſtance within the land, ſaid to be frequently in winter covered with ſnow, over which the air, as it paſſes, muſt needs be much chilled. Hence it comes to paſs, that the air coming according to the general rule, out of the N. E. in the *Indian* Seas, is ſometimes hotter, ſometimes colder than that which by this circulation, is returned out of S. W. as is clear from the times wherein theſe winds ſet in, viz. in *April*, when the ſun begins to warm thoſe countries to the north, the S. W. monſoon begins, and blows during the heats till *October*, when the ſun being retired, and all things growing colder northward, and the heat increaſing to the ſouth, the N. E. winds enter and blow all the winter till *April* again.

269. And it is undoubtedly from the ſame principle, that to the ſouthward of the equator, in part of the *Indian Ocean*, the N. W. winds ſucceed the S. E. when the ſun draws near the tropic of *Capricorn*. But I muſt confeſs, that in this latter occurs a difficulty not well to be accounted for, which is, why this change of the monſoons ſhould be any more in this Ocean, than in the ſame latitudes in the *Ethiopic*, where there is nothing more certain than a S. E. wind all the year.

270. 'Tis likewiſe very hard to conceive, why the limits of the trade winds ſhould be fixed about the 30° of latitude all round the globe, and that they ſhould ſo ſeldom tranſgreſs or fall ſhort of thoſe bounds; as alſo, that in the *Indian* Sea only the northern part ſhould be ſubject to the changeable monſoons, and in the ſouthern there ſhould be a conſtant S. E."

271. There may perhaps be ſome cauſes of theſe periodical winds, which we cannot ſee altogether a ſolution of; but if all the circumſtances of ſituation, heat, cold, &c. were known, there is no reaſon to doubt but that they might be accounted for from the principles here delivered.

272. Winds over the ſame place, at different altitudes, are found to blow in different directions; for we ſee clouds at different altitudes moving in different directions; and experiments with air ballons prove the ſame.

273. We may further obſerve in reſpect to the direction in which winds blow, that if a current ſet off in any one direction, north eaſt for inſtance, and move in a great circle, it will not continue to move on that point of the compaſs, becauſe a great circle will not meet all the meridians at the ſame angle. This circumſtance therefore ſhould enter into our conſideration, in eſtimating the direction of the wind. High mountains are alſo obſerved to change its direction. On the lake of *Geneva* there are only two winds, that is, either up or down the valley. And the like is known to happen at other ſuch places.

274. The *constant* and *periodical* winds blow only at sea; at land, the wind is always *variable*.

275. Besides the winds already mentioned, there are others called *land* and *sea breezes*. The air over the land being hotter during the day than the air over the sea, a current of air will set in from the sea to the land by day; but the air over the sea being hotter than that over the land at night, the current at night will be from the land to the sea. This is very remarkable in islands situated between the tropics. Mr. Clare exemplifies this, by the following experiment: In the middle of a vessel of water, place a water-plate of warm water, the water in the vessel representing the ocean, and the plate, the island rarefying the air over it. Then hold a lighted candle over the cold water, and blow it out, and the smoke will move towards the plate. But if the plate be cold and the surrounding fluid warm, the smoke will move in the contrary direction. The sea breezes in the West Indies begin to appear about 9 in the morning, in a fine black curl upon the water, approaching the shore; it increases gradually till noon, and dies away at 4 or 5 in the afternoon. About 6 in the evening it changes to a land breeze, which blows from the land to the sea, and lasts till 8 in the morning.

276. Dr. Derham, from repeated observations upon the motion of light downy feathers, found that the greatest velocity of the wind was not above 60 miles in an hour. But Mr Brice justly observes, that such experiments must be subject to great inaccuracy, as the feather scannot proceed in a straight line; he therefore estimates the velocity by means of the shadow of a cloud over the earth by which he found, that in a great storm, the wind moves 63 miles in an hour; when it blows a fresh gale, at the rate of 21 miles in an hour; and in a small breeze, at the rate of about 10 miles in an hour: but this method takes for granted that the clouds move as fast as the wind. It is probable that the velocity is something more than is here stated. Mr. Rouse makes the velocity of a hurricane which tears up trees, &c. to be 100 miles in an hour.

277. There are certain lakes which at times, are agitated during a calm season, by some unknown cause; and the phænomenon is called a *bottom wind*. Mr. Dalton, in his *Meteorological Observations*, informs us, that Mr Crosthwaite has been pretty assiduous in procuring intelligence respecting these phænomena, and in observing any circumstances which might lead to a discovery of the cause; but nothing has yet occurred to him, that promises to throw any light upon the subject.

Observations made on Derwent Lake.

1789

April 30. From 8 A. M till noon, the lake pretty much agitated.

August 9. At 8 A.M. the lake in very great agitation; white breakers on large waves, &c. without wind.

August 29. At 9 A. M, a small bottom wind.

1790.

June 20. At 8 P. M a bottom wind on the lake.

October 11. At 8 P. M a bottom wind on the lake.

December 1. At 9 P. M. a strong bottom wind on the lake.

1792

October 28. At 1 P. M. a bottom wind; the water much agitated.

278. In many parts of the world, more particularly in the *West Indies*, they are attacked by hurricanes; these happen there in the rainy season, principally in the month of August; destroying all the produce of the ground; tearing up trees; blowing down buildings; and inundating large tracts of the country. They are sudden and very violent storms of wind, rain, thunder and lightning attended with a great swelling of the sea, and sometimes with earthquakes. There are signs by which the inhabitants are warned of their approach. They come on either at the quarter, or at the full change of the moon. If they come on at the full change, then at the preceding change, the sky is troubled, the sun more red than usual, there is a dead calm below, and the tops of the mountains are free from those mists which usually hover about them. In the caverns of the earth, and in wells, you hear a hollow rumbling sound, like the rushing of a great wind. At night, the stars seem much larger than usual, and are surrounded with a sort of burs; the north west sky has a black and menacing appearance; the sea emits a strong smell, and rises into vast waves, often without any wind. The wind itself now forsakes its usual eastern steady stream, and shifts about to the west, from whence it sometimes, with intermissions, blows violently and irregularly for about 2 hours at a time.

279. The quality of air depends in a great measure upon the soil over which it passes. The sandy deserts of *Africa* and *Arabia*, give a burning heat and blasting quality to the air passing over them. At *Goree*, in the river *Senegal*, there is an eastearly wind from the inland parts, with which those who are suddenly met by it in the face are scorched, as by a blast from a furnace. At *Falkland Islands* an extraordinary blasting wind is felt, but its duration is seldom above 24 hours. It cuts down the herbage, as if fires had been made under them; the leaves are parched up and crumble into dust; fowls are seized with cramps, and never recover; men are oppressed with a stopped perspiration, heaviness at the breast, and sore throat, but they recover with proper care. But the most dreadful winds are those at the deserts near *Bagdad*, called the *samiel*, or *mortifying wind*. The camels perceive their approach, and are said to make an unusual noise, and cover their noses in the sand. To escape their effects, travellers throw themselves as close as possible on the ground, and wait till it has passed over, which is commonly in a few minutes. Thus some escape; but those who die, have their limbs mortified. If this wind meet with a shower of rain, it is said to be deprived of its noxious quality. It is also said, that it never

never passes the walls of the city. In *Italy* there is a wind called by the *Italians*, *Sirocco*. It blows for several days, and its mean heat is about 112 of *Fahrenheit*'s thermometer. It is fatal to vegetation, and destructive to the inhabitants; depressing their spirits, and suspending the powers of digestion; so that they who venture to eat a heavy supper whilst these winds prevail are frequently found dead the next morning. It is felt with peculiar violence at *Palermo*, where the inhabitants shut their doors and windows; and where there are no shutters, they hang up wet blankets, and servants are employed to keep them wet. No body ventures out, if he can possibly avoid it.

280. Mr. Bruce, in relating the particulars of his journey across the *deserts of Africa*, mentions prodigious pillars of sand, moving with great velocities. Eleven of them appeared at once, at the distance of about three miles from him; the greatest diameter of the largest was estimated at ten feet. The same phænomenon appeared again within a few days after: more pillars in number, but less in size. They began immediately after sunrise, and his rays shining through them, gave them the appearance of pillars of fire.

281. There is a phænomenon called a *water spout*, hanging under a deep cloud, in the form of a cone with the vertex downwards; and under it the sea boils up, and rises in a conical form; these two cones sometimes meet, and they generally begin to appear together; but sometimes the boiling of the sea appears first. The position of the cones is mostly perpendicularly to the sea, but sometimes it is oblique; and sometimes the spout is in the form of a curve. They frequently disappear suddenly, and sometimes they move for a considerable space before they break. The form of the water spout is more properly that of a speaking trumpet, the smaller end being downwards. Sometimes these water spouts appear at land. When they appear at sea, and are approaching a ship, it is said that the sailors fire at them and break them; as it might be dangerous if they were to meet with a ship and break over it. It is with good reason supposed that this is an electrical phænomenon; for they generally appear in months which are subject to thunder storms, and are commonly preceded, accompanied, or followed by lightning, rain, or hail. Flashes of light have been seen about them. But the most remarkable circumstance is, that they have been dispersed by presenting to them sharp pointed knives or swords. The analogy also between a water spout and electricity may be shown, by hanging a drop of water on the under side of a plate of brass connected with the prime conductor, and placing a vessel of water under, at a small distance; then upon working the machine, the water will descend from the drop in a conical form, and the water in the vessel will rise up under it in the form of a cone; resembling very accurately the water spout, and the ascent of the water in the sea under. If we therefore suppose the cloud to be strongly charged with the electric matter, we have cause sufficient to solve the phænomenon. This theory of water spouts is confirmed by one which Mr. Forster gives an account of in his voyage round the world. On the coast of *New Zealand*, he saw the water in a space of 50 or 60 furlongs, move towards its centre, and there rising into vapour, by the force of the whirling motion which it had, ascended in a spiral form towards the clouds; directly over which the cloud descended in a gradually tapered long slender tube, which soon united with the ascending spiral in a cylindrical form. The water was whirled upwards with great violence in a spiral, and appeared to leave a hollow space in the middle; so that it seemed to form a hollow tube; and this was rendered probable, as it looked exactly like a hollow glass tube. After some time, the column became incurvated, and then broke, with the appearance of a flash of lightning.

282. *A whirlwind* is a wind which rises suddenly; is extremely rapid and impetuous, taking up all light substances from the earth which it may meet with, and carrying them up in a spiral motion. Dr. Franklin supposes that a whirlwind and a water spout proceed from the same cause; and this opinion is strengthened by the following circumstances. They have each a progressive and circular motion; they usually rise after calms and great heats, and most frequently happen in warm latitudes, the wind blows every way both to the whirlwind and water spout; and a water spout has moved from the sea to the land and produced all the effects of a whirlwind. They are both of them probably therefore the effects of the electrical fluid.

On the Barometer.

283. The *Barometer* is an instrument to measure the weight or pressure of the atmosphere, and is so well known, that it is unnecessary here to describe it. Suffice it to say, that the mercury in the glass tube is supported by the pressure of the air upon the mercury in the bason, in which the lower and open end of the tube is immersed; and the space in the tube above the mercury is a vacuum. When therefore the pressure of the air is increased, the mercury must rise in the tube; and when the pressure is diminished, the mercury must fall. Upon the level of the surface of the earth, the limits of the height of the mercury in the tube above the surface of the mercury in the bason, is from 28 to 31 inches; a graduated scale is therefore placed against the tube from 28 to 31 inches, in order to ascertain the height of the mercury in the tube. But those barometers which are made to measure the heights of mountains, are graduated much lower; because, as you ascend in the atmosphere, the mercury falls. When the mercury stands at the altitude of 30 inches, the pressure of the air upon every square inch of the earth's surface is about 15 lb. avoirdupoise. At any other altitude of the mercury, the pressure will be in proportion to the altitude. Hence, if we take the surface of a middle sized man to be 14½ square feet, when the air is lightest, its pressure on him is 13,2 tons, and when heaviest it is 14,3 tons; the difference of which is 2464 lb. This difference of pressures must greatly affect us in

in respect to our animal functions and therefore in respect to our health; more especially when the change is sudden. The pressure of the air upon the whole surface of the earth, is about 7767029797356342 9 tons.

Dr. Halley's Account of the rising and falling of the Mercury in a Barometer, upon the Change of Weather.

284. To account for the different heights of the mercury at several times, it will be necessary to enumerate some of the principal observations made upon the barometer.

1st, In calm weather, when the air is inclined to rain, the mercury is commonly low.

2dly, In serene, good, settled weather, the mercury is generally high.

3dly, Upon very great winds, though they be not accompanied with rain, the mercury sinks lowest of all, with relation to the point of the compass the wind blows upon.

4thly, The greatest heights of the mercury, *cæteris paribus*, are found upon easterly and north-easterly winds.

5thly, In calm frosty weather, the mercury generally stands high.

6thly, After very great storms of wind, when the quicksilver has been low, it generally rises again very fast.

7thly, The more northerly places have greater alterations of the barometer than the more southerly.

8thly, Within the tropics, and near them, those accounts we have had from others, and my own observations at *St Helena*, make very little or no variation of the height of the mercury in all weathers.

285. Hence I conceive, that the principal cause of the rise and fall of the mercury, is from the variable winds which are found in the temperate zones, and whose great inconstancy here in England is most notorious.

286 A second cause is the uncertain exhalation and precipitation of the vapours lodging in the air, whereby it comes to be at one time more crowded than another, and consequently heavier; but this latter in a great measure depends upon the former. Now from these principles I shall endeavour to explicate the several phænomena of the barometer, taking them in the same order I laid them down.

1st, The mercury being low inclines it to rain, because the air being light, the vapours are no longer supported thereby, being become specifically heavier than the medium wherein they floated; so that they descend towards the earth, and in the fall meeting with other aqueous particles, they incorporate together and form little drops of rain. But the mercury's being at one time lower than at another, is the effect of two contrary winds blowing *from* the place where the barometer stands, whereby the air of that place is carried both ways from it, and consequently the incumbent cylinder of air is diminished, and accordingly the mercury sinks. As for instance, if in the *German Ocean* it should blow a gale of westerly wind, and at the same time an easterly wind in the Irish Sea; or if in *France* it should blow a northerly wind, and in *Scotland* a southerly, it must be granted me that, that part of the atmosphere impendant over *England* would thereby be exhausted and attenuated, and the mercury would subside, and the vapours which before floated in those parts of the air of equal gravity with themselves, would sink to the earth,

2dly, The great height of the barometer is occasioned by two contrary winds blowing *towards* the place of observation, whereby the air of other places is brought thither and accumulated; so that the incumbent cylinder of air being increased both in height and weight, the mercury pressed thereby must needs rise and stand high, as long as the winds continue so to blow; and then the air being specifically heavier, the vapours are better suspended, so that they have no inclination to precipitate and fall down in drops; which is the reason of the serene good weather, which attends the greater heights of the mercury.

3dly, The mercury sinks the lowest of all by the very rapid motion of the air in storms of wind. For the tract, or region of the earth's surface, wherein these winds rage, not extending all round the globe, that stagnant air which is left behind, as likewise that on the sides, cannot come in so fast as to supply the evacuation made by so swift a current: so that the air must necessarily be attenuated when and where the said winds continue to blow, and that more or less according to their violence; add to which, that the horizonal motion of the air being so quick as it is, may in all probability take off some part of the perpendicular pressure thereof: and the great agitation of its particles is the reason why the vapours are dissipated and do not condense into drops so as to form rain, otherwise the natural consequence of the air's rarefaction.

4thly, The mercury stands the highest upon an easterly or north easterly wind, because in the great *Atlantic Ocean*, on this side the 35th degree of north latitude, the westerly and south-westerly winds blow almost always trade, so that whenever here the wind comes up at east and north-east, it is sure to be checked by a contrary gale as soon as it reaches the ocean; wherefore according to what is made out in our second remark, the air must needs be heaped over this island, and consequently the mercury must stand high, as often as these winds blow. This holds true in this country, but it is not a general rule for others where the winds are under different circumstances; and I have sometimes seen the mercury here as low as 29 inches, upon an easterly wind; but then it blew exceeding hard, and so comes to be accounted for by what was observed upon the third remark.

5thly, In calm frosty weather the mercury generally stands high, because (as I conceive) it seldom freezes but when the wind comes out of the northern and north-eastern quarters, or at least unless these winds blow at

no great diſtance off; for the northern parts of *Germany*, *Denmark*, *Sweden*, *Norway*, and all that tract from whence north eaſtern winds come, are ſubject to almoſt continual froſt all the winter; and thereby the lower air is very much condenſed, and in that ſtate is brought hitherwards by thoſe winds, and being accumulated by the oppoſition of the weſterly wind blowing in the Ocean, the mercury muſt needs be preſſed to a more than ordinary height; and as a concurring cauſe, the ſhrinking of the lower parts of the air into leſſer room by cold, muſt needs cauſe a deſcent of the upper parts of the atmoſphere to reduce the cavity made by this contraction to an equilibrium.

6thly, After great ſtorms of wind, when the mercury has been very low, it generally riſes again very faſt. I once obſerved it to riſe 1¼ inch in leſs than 6 hours, after a long continued ſtorm of ſouth weſt wind. The reaſon is, becauſe the air being very much rarefied by the great evacuations which ſuch continued ſtorms make thereof, the neighbouring air runs in more ſwiftly to bring it to an equilibrium; as we ſee water runs the faſter for having a great declivity.

7thly, The variations are greater in the more northerly places, as at *Stockholm* greater than at *Paris* (compared by Mr. PASCHALL), becauſe the more northerly places have uſually greater ſtorms of wind than the more ſoutherly, whereby the mercury ſhould ſink lower in that extreme; and then the northerly winds bringing the condenſed and ponderous air from the neighbourhood of the pole, and that again being checked by a ſoutherly wind at no great diſtance, and ſo heaped, muſt of neceſſity make the mercury in ſuch caſe ſtand higher in the other extreme.

8thly, Laſtly, this remark, that there is little or no variation near the equinoctial, as at *Barbadoes* and *St. Helena*, does above all things confirm the hypotheſis of the variable winds being the cauſe of theſe variations of the height of the mercury; for in the places above-named, there is always an eaſy gale of wind blowing nearly upon the ſame point, viz. E N.E. at *Barbadoes*, and E. S. E. at *St. Helena*, ſo that there being no contrary currents of the air to exhauſt or accumulate it, the atmoſphere continues much in the ſame ſtate: however, upon hurricanes (the moſt violent of ſtorms) the mercury has been obſerved very low, but this is but once in two or three years, and it ſoon recovers its ſettled ſtate of about 29½ inches.

287 The principal objection againſt this doctrine is, that I ſuppoſe the air ſometimes to move *from* thoſe parts where it is already evacuated below the equilibrium, and ſometimes again *towards* thoſe parts where it is condenſed and crowded above the mean ſtate, which may be thought contrary to the laws of Statics, and the rules of the equilibrium of fluids. But thoſe who ſhall conſider how when once an impetus is given to a fluid body, it is capable of mounting above its level, and checking others that have a contrary tendency to deſcend by their own gravity, will no longer regard this as a material obſtacle; but will rather conclude, that the great analogy there is between the riſing and falling of the water upon the flux and reflux of the ſea, and this of accumulating and extenuating the air, is a great argument for the truth of the hypotheſis For as the ſea, over againſt the coaſt of *Eſſex* riſes and ſwells by the meeting of the two contrary tides of flood, whereof the one comes from the S. W along the channel of England, and the other from the north; and on the contrary, ſinks below the level upon the retreat of the waters both ways, in the tide of ebb; ſo it is very probable, that the air may ebb and flow after the ſame manner; but by reaſon of the diverſity of cauſes whereby the air may be ſet in moving, the times of theſe fluxes and refluxes therefore are purely caſual, and not reducible to any rule, as are the motions of the ſea, depending wholly upon the regular courſe of the moon. Thus far Dr. HALLEY.

288 The following rules are given for judging of the weather by Mr. PATRICK, and are eſteemed the beſt which we have.

1. The riſing of the mercury preſages, in general fair weather; and its falling, foul weather; as rain, ſnow, high winds, and ſtorms.

2. In very hot weather, the falling of the mercury indicates thunder.

3. In winter, the riſing indicates froſt: and in froſty weather, if the mercury fall 3 or 4 diviſions, there will follow a thaw. But in a continued froſt, if the mercury riſe, it will ſnow.

4. When foul weather happens ſoon after the falling of the mercury, expect but little of it; and on the contrary, expect but little fair weather, when it proves fair ſhortly after the mercury has riſen.

5. In foul weather when the mercury riſes much and high, and ſo continues for 2 or 3 days before the foul weather is quite over, then expect a continuance of fair weather to follow.

6. In fair weather when the mercury falls much and low, and thus continues, for 2 or 3 days before the rain comes, then expect a great deal of wet, and probably high winds.

7. The unſettled motion of the mercury, denotes uncertain and changeable weather.

8. You are not ſo ſtrictly to obſerve the words on the plate, though in general the weather agrees with them: For if the mercury ſtand at *much rain* and then riſe to *changeable*, it denotes fair weather, though not to continue ſo long as if the mercury had riſen higher. And on the contrary, if the mercury ſtand at *fair* and fall to *changeable*, it denotes foul weather, though not ſo much as if it had ſunk lower.

289. The following rules are uſeful to judge when the mercury is riſing or falling.

1. If the ſurface of the mercury be convex, it is riſing.

2. If the ſurface of the mercury be concave, it is falling.

3. If the *middle* of the mercury be plain, it is neither riſing nor falling; for mercury put into a glaſs tube, will naturally

naturally have the parts adjacent to the tube convex.

4. As the mercury will adhere a little to the tube, before you note its height it is proper to shake the barometer a little, by giving it a little tap with the knuckle.

On the Thermometer.

290. A *Thermometer* is an instrument to measure different degrees of heat. It is a small glass tube with a bulb at the bottom, having the bulb and part of the tube filled with mercury, or spirits of wine. The tube is closed at the top, and the part not occupied by the fluid is a vacuum. Against the tube there is a scale to measure the expansion of the fluid under different temperatures; for fluids expand by heat, and contract by cold. An increase of temperature will therefore make the fluid rise in the tube, and a decrease of temperature will make it fall.

291. The thermometer now in use is that which is constructed by FAHRENHEIT. On this scale, the fluid stands at 32 when it just begins to freeze, and at 212 when put into boiling water; at temperate it stands at 55; at summer heat, at 76; at blood heat, at 98. If the scale be continued to 600, it gives the heat of boiling mercury; and if it be continued downwards to 39 below 0, it gives a degree of cold which will freeze mercury.

292. By means of the barometer and thermometer, the altitude of a mountain may be found to a great degree of accuracy. The following is the rule given by DR. MASKELYNE in his introduction to TAYLOR'S Logarithms; being the mean between those given by General ROY and Sir GEORGE SHUCKBURGH.

293. Given the altitudes of the barometer at two stations, with the heights of Fahrenheit's thermometer *attached* to the barometer, and the heights of two *detached* thermometers of the same kind, exposed to the air but sheltered from the sun at the two station, to find the perpendicular altitude of one station above the other.

RULE. Put H for the observed height of the barometer at the lower station and h for that at the upper station, D for the difference of heights of FAHRENHEIT'S thermometer *attached* to the barometer at the two stations, and m for the mean of the two heights of the two *detached* thermometers exposed freely for a few minutes to the open air in the shade, at the two stations; then the altitude of the upper station above the lower, in English fathoms, is thus expressed:

$$(\text{Log. } H - \text{log. } h \mp 0{,}45 \times D) \times (1 + m - 32 \times 0{,}00244.)$$

Where the upper sign — is to be used, when the thermometer *attached* to the barometer is highest at the lower station (which is most usual), and the lower sign +, when it is lowest at the lower station.

But to render the rule more generally useful, we shall put it down in common language.

RULE. Take the difference of the common logarithms of the observed heights of the barometers at the two stations, considering the first four figures, exclusive of the index, as whole numbers, and the remaining figures to the right as decimals, and *subtract* or *add* 0,45 multiplied by the difference of altitudes of FAHRENHEIT'S thermometer *attached* to the barometer at the two stations, according as it was highest at the *lower* or *upper* station; and this is nearly the required height. Then multiply the height thus nearly found, by the difference between the mean of the two altitudes of the two *detached* thermometers exposed to the air at the two stations, and 32°, and again that product by 0,00244. and the last product will be the correction of the altitude before nearly found; which *added* to or *subtracted* from the same according as the mean of the two altitudes of the *detatched* thermometers exposed to the air, was *higher* or *lower* than 32°, will give the true height of the upper station above the lower, in English fathoms; and this multiplied by 6, gives the true altitude in English feet.

Ex. Let the state of the barometers and thermometers be as follows; to find the altitude of one station above the other.

Barometers.	Thermometers.	
	attached.	*detached.*
Lower 30,16	59	58
Upper 24,19	47	42
	12 dif.	50 mean

30,16

	Log.
30,16 - - - -	14794,315
24,19 - - - -	13836,359
	957,954
Subtract - -	5,448=0,454×12
Altitude nearly - -	952,506
	18=50−32
	7620048
	952506
	17145,108
	0,00244
	68580432
	68580432
	34290216
Cor. add - - -	41,83406352
Alt. nearly - - -	952,506
True Alt. in - - -	994,340 fathoms
	6
	5966,04 feet

For heights which do not exceed 4000 or 5000 feet, Sir G. SHUCKBURGH gives the following rule:

Let A=the mean height of the two barometers in inches; a=the difference of the two in tenths of an inch; b= the number of feet in the table corresponding to the *mean* height of the two thermometers; x=the height of the mountain in feet; then $x=\frac{30ab}{A}$

Ther	Feet
32°	89,85
35	89,49
40	88,54
45	89,60
50	90,66
55	91,72
60	92,77
65	93,82
70	94,88
75	95,93
80	96,99

Ex Suppose the barometer at the bottom to be 29,72 inches, thermometer 64°; the barometer at the top to be 27,16 thermometer 58°; to find the altitude of the mountain

Here A=28,59 inches; a=22,6; the mean heat of the two thermometers=61, the proportional number corresponding to which found from the table is 92, 98 =b; hence $x=\frac{30\times22,6\times92,98}{28,59}=2205$ feet the height required.

294. The mean height of the barometer in London, from observations made at the Royal Society, is 29,88 inches; and the mean temperature, according to FAHRENHEIT's thermometer, is 58°. The mean height at the surface of the sea is 30,04 inches, the heat of the barometer being 55°, and that of the air 62°, according to Sir GEORGE SHUCKBURGH.

295. The heights of some of the most remarkable mountains in English feet.

	Feet
Snowden - - - - - - -	3555
Moel Eilio - - - - -	2371
Schihallien, west summit of - - -	3281
Kirk Yetton Cairn - - - -	1544
Skiddaw - - - - - - -	3240
Helvellyn - - - - - -	3300
Monte Rosa - - - - -	15084
Montblanc - - - - -	14432
Argentiere - - - - -	12172
Buet - - - - - - -	8894
Mole - - - - - - -	4283
Dole - - - - - - -	4293
Saleor - - - - - -	3284
Mont Cenis, at the Post - - - -	5031
Monte Velino - - - - -	8397
Vesuvius - - - - -	3938

Ætna

	Feet
Ætna	10954
Teneriff	11022
Monte Vifo	9997
Hecla, in Iceland	4 01
Table Hill, weſt Signal	1468
Pico Ruivo	5141
Caraboutron	7840
Canigou	9214
Quito	9374
Pichinea	15564
El Coracon	15783
Coraçon	15833
Chimboraco	20575

The heights of Snowden and Moel Eilio are above Carnarven Quay. The height of Schihallien is above Weem. The height of Kirk Yetton is above Leith Pier-head. The height of Skiddaw is above Derwent Lake, and of Helvellyn above Leathes Lake. The heights of Montblanc, Argentiere, Buet, Mole, Dole, Saleor, and Mont Cenis, are above the Lake of Geneva. The heights of the other mountains are above the Sea. The Lake of Geneva is 1228 feet above the Mediterranean Sea, and its greateſt depth is 393 feet.

On the Rain-gage.

296. The *Rain gage* is an inſtrument to ſhow the quantity of rain which falls upon the earth at any place where you may wiſh to make obſervations. It conſiſts of a funnel communicating with a cylindrical tube at its bottom, into which the rain is conveyed by the funnel. The depth of the water in the cylinder is meaſured by a rule fixed to a float, the rule paſſing through the center of the funnel. The diviſions on the rule ſhow the number of cubic inches of water that have fallen on a ſurface equal to the area of the top of the funnel. The funnel is ſo contrived as to prevent the water from evaporating.

297. To uſe the rain gage, ſo much water muſt firſt be put into the cylinder as will raiſe the float, ſo that 0 on the rule may exactly coincide with the aperture of the funnel. The gage ſhould be firmly fixed in a place, where, whatever winds blow, the fall of the rain may not be intercepted by any obſtacles By this inſtrument, the mean *annual* depths of rain in inches, at the places below, has been determined.

	Inches
London	21,4
Paris	19,6
Piſa in Italy	43,25
Zurich, Swiſſerland	32,25
Liſle, Flanders	24,0
Upminiſter, Eſſex	19,19
Townley, Lancaſhire	42,5
Kendal	64,5
Keſwick	6[illegible],55

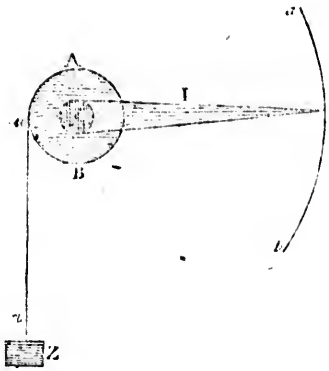
Mr. Dalton informs us, that the greateſt quantity of rain at *Kendal* in 24 hours, in five years 1788, 1789, 1790, 1791, 1792, was on the 2 d of April, 1792, 4,592 inches; at *Keſwick*, ſomething leſs. In the level parts of this kingdom, and in the neighbourood of London, the mean annual depth of rain is about 19 or 20 inches

298 It appears that the moſt rain falls in places near the ſea coaſt, and leſs and leſs as the places become more inland. The quantity which falls on the *weſtern coaſt* of *England* is ſometimes twice as much as falls at *London*. It is alſo found, that the nearer the inſtrument is to the ground, the more rain it collects. By experiments made by Dr. Heberden, from July 1766 to July 1767, the following reſults were obtained: On the top of Weſtminſter Abbey there fell 12,699 inches; on the top of a houſe 18,139 inches; at the bottom of the houſe, 22,628 inches; theſe are the mean annual quantities. Mr. Barrington placed two rain-gages, one upon *Mount Penning* in *Wales*, and the other on the plain below; and from July to November there fell at the upper gage 8,265 inches, and at the lower 8,766 inches. Hence it appears, that the quantity of rain depends upon the nearneſs of the place to the earth, and not on the height of the place. In comparing therefore the quantity of rain at two places by two rain gages, they ſhould be placed at the ſame diſtance from the earth.

On the Hygrometer.

299 The *Hygrometer* is an inſtrument to meaſure the moiſture and dryneſs of the air: and is formed of ſubſtances which will expand or contract upon any alteration of moiſture. Wood expands by moiſture and contracts by dryneſs; on the contrary, chord, catgut, &c. contract by moiſture and expand by dryneſs; and various mechanical contrivance have been invented, to render ſenſible the ſmalleſt variations in the lengths of theſe ſubſtances. We will deſcribe one of them, which any perſon may very eaſily make for himſelf.

Let



Let A B represent the section of a cylinder moveable about its axis, which is parallel to the horizon; at the end there is an index *I* moveable gainst a graduated arc *ab*; about this cylinder some catgut *ww* is wound, one end of which is fixed to the cylinder, and the other end to something immoveable at Z. Now as the moisture of the air increases, the catgut contracts and turns the cylinder, and the motion of the index shows the increase of the moisture; and as the air decreases in moisture, the catgut will lengthen, and the weight of the index will carry the cylinder back, and the index will show the corresponding decrease of moisture.

300. In order to make a perfect hygrometer, such substances must be used that will contract or expand in proportion to the quantity of moisture received. Mr. De Luc has made a great many experiments in order to find out such substances; and the result is, that whalebone and box, cut across the fibres, increase very nearly in proportion to the quantity of moisture received He preferred the whalebone, first, on account of its steadiness, in always coming to the same point at extreme moisture; secondly, on account of its greater expansion, it increasing in length above one eighth of itself, from extreme dryness to extreme moisture; lastly, it is more easily made thin and narrow

301. De Saussure and De Luc have proved by the hygrometer, that the air increases in dryness as you ascend in the atmosphere; so that in the upper attainable regions, it is constantly very dry except in the clouds. The former gentleman has also shown, that if the whole atmosphere passed from extreme dryness to extreme moisture, the quantity of water thus evaporated would not raise the barometer half an inch. Lastly, in chemical operations on the air, the greatest quantity of evaporated water that may be supposed in them at the common temperature of the atmosphere, even if they were at extreme moisture is not so much as the one hundredth part of their mass.

On the Ascent of Vapours, the Origin of Springs, and Formation of Rain, Snow, and Hail.

302. Vapours are raised from the surface of the moist earth and waters; the principal cause of which is, probably, the heat of the sun, the evaporation being always greatest when the heat is greatest. The difficulty of solving the phænomenon arises from hence, that we find a heavier fluid (water) suspended in a lighter fluid (air), contrary to the common principles of hydrostatics.

303. Dr. Halley supposed, that by the action of the sun upon the surface of the water, the aqueous particles become formed into hollow bubbles filled with warm and rarefied air, so as to make the whole bulk specifically lighter than air, in which case the particles will ascend. But there is great difficulty in conceiving how this can be effected. And if bubbles could be *at first* thus formed, when they ascend, the air within would soon be reduced to the same temperature of the air without, on which account they would immediately descend. The most probable supposition is, that evaporation is a chemical solution of water in air. We know that metals are dissolved in menstrums, and their particles diffused and suspended in the fluid, although their specific gravity be greater than that of the fluid. Heat promotes this solution; in the day time therefore the heat causes a more perfect solution than what can take place in the night when the air is colder; in which case, the water falls in dews and fogs. The vapours, thus raised by heat, ascend into the cold region of the atmosphere, and, not being there kept in a state of perfect solution, form clouds.

304. Mariotte supposed *Springs* to be owing to rain water and melted snow, which penetrating the surfaces of hills, and running by the side of clay or rocks which it cannot penetrate, at last comes to some place where it breaks out. This would account for the phænomenon, provided the supply from these causes was sufficient. Now Dr. Halley has discovered a cause sufficient for a supply; for he has proved by experiment, that the vapours which are raised, afford a much greater supply than is necessary. We will give the account in his own words

305. "We took a pan of water (salted to the degree of the saltness of the sea, by a solution of about a fortieth part of salt) about 4 inches deep, and $7\frac{1}{10}$ inches diameter, in which we placed a thermometer, and by means of a pan of coals, we brought the water to the same degree of heat which is observed to be that of the air in our hottest summers; the thermometer nicely showing it. This done, we affixed the pan of water, with the thermometer in it, to one end of the beam of the scales, and exactly counterpoised it with weights at the other end; and by the application or removal of the pan of coals, we found it very easy to maintain the water in the same degree of heat precisely. Doing this, we found the weight of the water sensibly to decrease; and at the end of two hours we observed, that there wanted

wanted half an ounce troy, all but 7 grains, or 233 grains of water, which in that time had gone off in vapour; though one could hardly perceive it smoke, and the water was not sensibly warm. This quantity in so short a time seemed very considerable, being little less than 6 ounces in 24 hours, from so small a circle as 8 inches diameter. To reduce this experiment to an exact *calculus*, and to determine the thickness of the skin of water which had evaporated, I assume the experiment alleged by Dr. Edw. Bernard to have been made in the *Oxford Society*, viz. that the cubic foot *English* of water weighs exactly 76 pounds troy; this divided by 1728, the number of inches in a foot, will give $253\frac{1}{3}$ grains, or half an ounce $13\frac{1}{3}$ grains for the weight of a cubic inch of water; therefore the weight of 233 grains is $\frac{233}{13\frac{1}{3}}$, or 35 parts of 38 of a cubic inch of water. Now the area of the circle, whose diameter is $7\frac{1}{10}$ inches, is 49 square inches, by which dividing the quantity of water evaporated, viz. $\frac{35}{38}$ of an inch, the quotient $\frac{175}{1862}$ or $\frac{1}{53}$, shows that the thickness of the water evaporated was the 53d part of an inch: but we will suppose it to be only the 60th part, for the facility of calculation. If therefore water, as warm as the air in summer, exhales the thickness of the 60th part of an inch in two hours from its whole surface, in 12 hours it will exhale $\frac{1}{10}$ of an inch; which quantity will be found abundantly sufficient to serve for all the rains, springs, and dews, and account for the *Caspian Sea*'s being always at a stand neither wasting nor overflowing; as likewise for the current said to set always in at the straights of *Gibraltar*, though those *Mediterranean Seas* receive so many, and so considerable rivers.

306. To estimate the quantity of water arising in vapours out of the sea, I think I ought to consider it only the time the sun is up, for that the dews return in the night as much if not more vapours than are then emitted; and in summer the days being longer than 12 hours, this excess is balanced by the weaker rays of the sun, especially when rising before the water is warmed: so that if I allow $\frac{1}{120}$ of an inch of the surface of the sea to be raised *per diem* in vapours, it may not be an improbable conjecture.

307. Upon this supposition every 10 square inches of the surface of the water, yields in vapour, *per diem*, a cubic inch of water; and every square foot, half a wine pint; every space of 4 square feet, a gallon; a mile square, 6914 tons; a square degree, supposed of 69 *English* miles, will evaporate 33 million of tons: and if the *Mediterranean* be estimated at 40 degrees long, and 4 broad allowances being made for the places where it is broader by those that are narrower, (and I am sure I guess at the least,) there will be 160 square degrees of sea; and consequently the whole *Mediterranean Sea* must lose in vapour, in a summer's day, at least 5280 millions of tons. And this quantity of vapour, though very great, is as little as can be concluded from the experiment produced: and yet there remains another cause, which cannot be reduced to the rule, I mean the winds, whereby the surface of the water is licked up, somewhat faster than it exhales by the heat of the sun, as it is well known to those that have considered those drying winds which blow sometimes.

308. The *Mediterranean* receives these considerable rivers: the *Iberus*, the *Rhone*, the *Tiber*, the *Po*, the *Danube*, the *Niester*, the *Borysthenes*, the *Tanais*, and the *Nile*, all the rest being of no great note, and their quantity of water inconsiderable. We will suppose each of these nine rivers to bring down ten times as much water as the river *Thames*, not that any of them is so great in reality, but to comprehend with them all the small rivulets that fall into the sea, which otherwise I know not how to allow for.

309. To calculate the water of the *Thames*, I assume that at *Kingston Bridge*, where the flood never reaches, and the water always runs down, the breadth of the channel is 100 yards, and its depth 3, it being reduced to an equality (in both which suppositions I am sure I take the most). Hence, the profile of the water in this place is 300 square yards: this multiplied by 48 miles, (which I allow the water to run in 24 hours, at 2 miles in an hour) or 84480 yards, gives 25344000 cubic yards of water to be evacuated every day, that is, 20300000 tons *per diem*; and I doubt not but in the excess of my measure of the channel of the river, I have made more than sufficient allowance for the waters of the *Brent*, the *Wandel*, the *Lea*, and the *Derwent*, which are all worth notice, that fall into the *Thames* below *Kingston*.

310. Now if each of the aforesaid nine rivers yield ten times as much water as the *Thames* doth, it will follow, that each of them yields but 203 millons of tons *per diem*, and the whole nine but 1827 millions of tons in a day; which is but little more than $\frac{1}{3}$ of what is raised by vapours out of the *Mediterranean* in twelve hours."

311. Thus the Doctor has shown that the waters, raised by vapours are vastly more than sufficient for the supply of all the rivers; the overplus may fall, partly upon the sea, and partly upon the flat lands, and not contribute to fill the rivers. We may therefore admit Mr. Mariotte's solution of the cause of springs.

312. Besides the *constant* springs, there are others which *ebb* and *flow* alternately, which may be thus accounted for. The water, before it breaks out, may meet with a large cavity on the side of the hill, and upon the overflowing of this reservoir, it may find an aperture, and make its escape; in case of dry weather, therefore, the supply of water may not be sufficient to keep it full, in which case, the spring will cease to flow and continue dry, till a supply causes it to overflow, and produce again the spring.

313. There is another theory to account for springs and rivers, which refers this cause to a great abyss of waters occupying the central parts of our globe. It asserts, that all the phænomena of springs are chiefly derived from the vapours, veins, and issues, of this great abyss, into which they are returned; and that a perpetual circulation and equality is kept up; the springs never

never failing, and the sea, by reason of its communication with the subterraneous waters, never overflowing. In sinking mines and wells from 8 to 800 feet deep, it is common to break in upon powerful sources of water, and these sometimes at very great depths. Springs near the surface may have their sources from reservoirs which lie deeper, and they in their turns are fed by larger and deeper, till we come to the grand repository of all, which is supposed to keep up a communication with the sea, in consequence of which, the water in the earth has always a tendency to rise to the level of the sea. Dr. Derham has shown, that springs occur in great plenty, and are constant in their course, even in times of the greatest drought, where the country is in general very low, and there are no mountain tops to condense the vapours. M. Gualteri says, that the waters discharged by the rivers in Italy into the sea, are to the rain which falls upon the land, as 55 to 27. The earth is also moistened to a greater depth than can be accounted for form the falling of the rain. From all these circumstances it is concluded, that there must be subterraneous reservoirs of water. It is not unlikely but that this, and the cause of springs and rivers assigned by Dr. Halley, may both operate.

314. Clouds are formed by the water raised by evaporation, and are of the same nature as dews and fogs upon the earth. When the water in the air ceases to be suspended, it falls down, and the particles uniting in falling, form drops. Various, probably, are the causes of the precipitation of the water. After the air is saturated with vapour, a sudden diminution of the density of the air will cause it to part with some of its vapours; for as a certain quantity of air can hold but a certain quantity of water in solution, if that air become rarefied, it will not hold all its water in solution, and a precipitation will take place. As vapour is principally raised by heat a variation of temperature will probably cause a precipitation. Also, we know by an electrometer, that the air is always in a state of electricity, sometimes positive, and sometimes negative. From M. de Saussure's observations, in winter the electricity was generally weakest in an evening, when the dew had fallen, until the sun's rising; it afterwards increased, and generally before noon it attained its maximum, and then diminished, till the fall of the dew, when it would be sometimes stronger than it had been during the whole day; after which, it would gradually diminish the whole night. In summer, in general, if the ground have been dry for some days, and the air been dry also, the electricity generally increases from the rising of the sun till 3 or 4 in the afternoon, when it is strongest; it then diminishes till the dew begins to fall, and then it increases; but after this it declines, and is very small during the night. Now Beccaria reckons rain, hail, and snow amongst the effects of the electricity of the atmosphere. Clouds which bring rain he thinks, are produced in the same manner as thunder-clouds are, only by a less degree of electricity. He remarks several circumstances attending rain without lightning, which make it probable that it is produced by the same cause as when it is attended by thunder and lightning. Light has been seen amongst the clouds by night in rainy weather; and even by day, rainy clouds are seen to have a brightness evidently independent of the sun. The intensity of electricity also in his apparatus, usually corresponded very well with the quantity of rain. The phænomena also of thunder, lightning, and rain, are very frequently observed to accompany each other, which shows the conection they have with a common cause. He supposes that previous to rain, a quantity of electric matter escapes out of the earth, and in its ascent, collects a quantity of vapour, and thus the air becomes overcharged with vapours. Hence, the rain will be heavier the more vigorous the electricity is; and this is agreeable to observation. Mr. de Luc has shown that water in a state of vapour combined with the air, produces no moistness, and therefore concludes that rain does not arise from the moisture in the atmosphere *prior* to the rain. The decomposition produces the moisture and then the rain. If it be very cold in these regions where the rain begins to be formed, it then descends in snow; and when the drops of rain are formed, and are descending, if in their descent they pass through a region of the air cold enough to freeze them, they descend in hail.

On the Temperature of different Parts of the Earth.

315. The presence of the sun is one of the principal sources of heat, and its absence the cause of cold; and were these the only sources of heat and cold, in the same parallel of latitude there would be the same degree of heat or cold at the same season; but this is found to be contrary to matter of fact; the temperature of the eastern coast of *North America* is much colder than the western coast of *Europe*, under the same latitude. Very hot days are frequently felt in the coldest climates; and very cold weather, even perpetual snow is found in countries under the equator. We must therefore seek for other causes of heat and cold, and these must evidently be partly local.

316. One great source of heat is from the earth; whether this arises from any central fire, or from a mass of heat diffused through the earth, it is not perhaps easy to say: the latter cause is perhaps the most probable; and in this case, the heat which is thus gradually lost is renewed again by the sun. This heat imparted from the earth to the atmosphere, tends greatly to moderate the severity of the winter's cold. It is found by observation, that the same degree of heat resides in all subterraneous places at the same depth, varying a little at different depths, but is never less than 36° of Fahrenheit's thermometer. There is however an exception to this in mines, where there is probably some chemical operations going forwards. Mr. Kirwan in his *Estimate of the Temperature of different Latitudes*, and to whom we are principally indebted for what we shall here give upon

upon this subject, observes, that at 80 or 90 feet (if this depth have any communication with the open air, and perhaps, at a much less depth if there be no such communication) the temperature of the earth varies very little, and generally approaches to the *mean* annual heat. Thus the temperature of springs is nearly the same as the mean annual temperature, and varies very little in different seasons. The temperature of the cave at the observatory at *Paris* is about 53½ degrees, and varies about half a degree in very cold years; its depth is about 90 feet. The internal heat of the earth in our climate is always above 40°, and therefore the snow generally begins to melt first at the bottom. The next source of heat is the condensation of vapour. It is well known that vapour contains a great quantity of heat, which produces no other effect, but that of making it assume an aërial, expanded state, until the vapour is condensed into a liquid; during which condensation a certain quantity of heat escapes, and warms the surrounding atmosphere. This condensation is frequently formed by the attraction of an electrical cloud, and hence arises the great sultriness which we frequently experience before rain, and particularly before a thunder storm.

317. As the earth is one of the great sources of heat, warming the surrounding air, distance from the earth must be a source of cold; and thus we find that as you ascend in the atmosphere, the cold increases. In the vicinity of Paris, the temperature of the earth being 47°, at the estimated height of 11084 feet it was found to be 21°, or 11° below congelation, by M. CHARLES who ascended in a ballon. And Lord MULGRAVE, at the bottom of *Hacklyt Hill*, lat. 80°, found the temperature of the air 50°; but on the top, at the height of 1503 feet, only 42°. Hence we find, that the highest mountains, even under the equator, have their tops continually covered with snow. Mr. BOUGUER found the cold of *Pinchina*, one of the *Cordelieres*, immediately under the line, to extend from 7° to 9° below the freezing point every morning before sun-rise; and hence at a certain height, which varies in almost every latitude, it constantly freezes at night all the year round, though in the warm climates it thaws to some degree the next day. This height he calls the *lower Term of congelation*: between the tropics he places it at the height of 15577 feet, *English* measure. The next great source of cold is *evaporation*. The same cause which makes the condensation of vapour a source of heat, makes evaporation the source of cold; as it absorbs the fire in the latter instance, which it gives out in the former: the heat thus absorbed is called *latent* heat, it producing, in that state, no sensation of warmth. At a certain height above the lower term of congelation in never-freezes, not because the cold decreases, but because the vapours do not ascend so high; this height Mr. BOUGUER calls the *upper term of congelation*, and under the equator he fixes it at the height of 28000 feet. Mr. KIRWAN has given us the following *mean* height of the *upper* and *lower* terms of congelation, for the latitude of every five degrees, in *feet*.

Lat.	Alt. *lower* Term.	Alt. *upper* Term.	Lat.	Alt. *lower* Term.	Alt. *upper* Term.
0°	15577	28000	45°	7658	13730
5	15457	27784	50	6260	11253
10	15067	27084	55	4912	8830
15	14498	26061	60	3684	6546
20	13719	24661	65	2516	4676
25	13030	23423	70	1557	2809
30	11592	20838	75	748	1346
35	10664	19169	80	120	207
40	9016	16207			

318. Sometimes the temperature of the upper air is higher than that of the lower air, particularly when a large mass of vapours is condensed by electrical agency; for no part of the heat given out by that cause being lost by communication with air much colder, that which surrounds the vapours so condensed, must be heated to a considerable degree. The clouds, by absorbing the sun's rays, are more heated than the clear air would be. These, and other circumstances, render the true height of the terms of congelation at any time, subject to considerable uncertainty.

319. The

319. The clearing away of woods leſſens the vapours, and conſequently diminiſhes the quantity of rain, and increaſes the temperature. Several pariſhes in *Jamaica* which uſed to produce fine crops of ſugar canes, are now dry for 9 months in a year, and are turned into cattle-pens, through the clearing away of the woods. Hence, water is moſt plentiful in thoſe countries, where woods abound, and the beſt ſprings are there found. In *America*, ſince the woods in the neighbourhood of their towns have been cut down, many ſtreams have become dry; and others have been reduced ſo low, as to cauſe great interruptions to the miller.

320. Of evaporation, the following facts may be obſerved. 1. That in our climates, evaporation is about four times as great from the 21ſt of March to the 21ſt of September, as from the 21ſt of September to the 21ſt of March.

2. That, other circumſtances being the ſame it is greater in proportion as the difference between the temperature of the air, and that of the evaporating ſurface is greater; and ſo much the ſmaller as the difference is ſmaller; and therefore ſmalleſt when the temperature of the air and evaporating liquor are equal. The former part of this propoſition however requires ſome reſtriction; for if air be more than 15 degrees colder than the evaporating ſurface, there is ſcarce any evaporation; but on the contrary, it depoſits its moiſture on the ſurface of the liquor.

3. The degree of cold produced by evaporation, is always much greater when the air is warmer than the evaporating ſurface, than that which is produced when the ſurface is warmer than the air. Hence warm winds, as the *Sirocco* and *Harmatan*, are more drying than cold winds.

4. Evaporation is more copious when the air is leſs loaded with vapours, and is therefore greatly promoted by cold winds flowing into warmer countries.

5. Evaporation is greatly increaſed by a current of air or wind flowing over the evaporating ſurface, becauſe unſaturated air is conſtantly brought into contact with it. Hence, calm days are hotteſt, as has commonly been remarked.

6. Tracts of land covered with trees or vegetables emit more vapour than the ſame ſpace covered with water. Mr. WILLIAMS (*Philadelphia Tranſactions*) found this quantity to amount to $\frac{1}{3}$ more. Hence the air about a wood or foreſt is made colder by evaporation from trees and ſhrubs, while the plants themſelves are kept in a more moderate heat, and ſecured from the burning heat of the ſun by the vapours perſpired from the leaves. Thus, we find the ſhade of vegetables more effectual to cool us, as well as more agreeable, than the ſhade from rocks and buildings.

321. The heat and cold of different countries are tranſmitted from one to the other, by the medium of winds.

322. From what has been obſerved it is manifeſt, that ſome ſituations are better fitted to receive or communicate heat, than others; thus, high and mountainous ſituations being nearer to the ſource of cold than lower ſituations; and countries covered with woods, as they prevent the acceſs of the ſun's rays to the earth, or to the ſnow which they may conceal, and preſent more numerous evaporating ſurfaces, muſt be colder than open countries, though ſituated in the ſame latitude. And ſince all tracts of land preſent infinite varieties of ſituation, uniform reſults cannot here be expected. Mr. KIRWAN obſerves therefore, that it is on water only that we muſt ſeek for a ſtandard ſituation with which to compare the temperature of other ſituations. Now the globe contains, properly ſpeaking, but two great tracts of water, the Atlantic Ocean and the Pacific Ocean; which may each be divided into north and ſouth, as they lie on the northern or ſouthern ſide of the equator. In this tract of water, he choſe that ſituation for a ſtandard which recommends itſelf moſt by its ſimplicity, and freedom from any but the moſt permanent cauſes of alteration of temperature; viz. that part of the Atlantic which lies between 80° north and 45° ſouth latitude, and extending ſouthwards as far as the Gulph ſtream, and to within a few leagues of the Coaſt of *America*; and that part of the Pacific Ocean which lies between 45° north and 40° ſouth latitude, and from 20° to 275° eaſt longitude. Within this ſpace, the *mean* annual temperature will be found as expreſſed by the following table. The temperatures beyond 80° latitude are added, though not ſtrictly within the ſtandard.

A Table

A Table of the *mean* Annual Temperature of the ſtandard ſituation, in every degree of Latitude.

Lat.	Temp.	Lat.	Temp.	Lat.	Temp.
0°	84	33°	68,3	62°	42,7
5	83,6	34	67,4	63	41,9
6	83,4	35	66,6	64	41,2
7	83,2	36	65,7	65	40,4
8	82,9	37	64,8	66	39,7
9	8 ,7	38	63,9	67	39,1
10	82,3	39	63,	68	38,4
11	82	40	62,	69	37,8
12	81,7	41	61,2	70	37,2
13	8 ,3	42	60,3	71	36,6
14	80,8	43	59,4	72	36
15	80.4	44	58,4	73	35,5
16	79,9	45	57,5	74	35
17	79,4	46	56,4	75	34,5
18	78,9	47	55,6	76	34,1
19	78,3	48	54,7	77	33,7
20	77,8	49	53,8	78	33,2
21	77,2	50	52,9	79	32,9
22	76,5	51	52,4	80	32,6
23	75,9	52	51,1	81	32,2
24	75,4	53	50,2	82	32
25	74,5	54	49,2	83	31,7
26	73.8	55	48,4	84	31,5
27	72,8	56	47,5	85	31,4
28	72,3	57	46,7	86	31,2
29	71,5	58	45,8	87	31,14
30	70,7	59	45,1	88	31,10
31	69,9	60	44,3	89	31,04
32	69,1	61	43,5	90	31

323 The rule by which this table has been computed, was given by the famous aſtronomer TOBIAS MAYER of *Gottingen*, and is as follows; it was conſtructed from knowing the mean annual temperatures of two latitudes. Let s be the ſine of the latitude; then the mean annual temperature will be $84-53\times s^2$; that is, *from* 84 *ſubtract* 53 *multiplied into the ſquare of the ſine of the latitude, and the remainder is the mean annual temperature.*

324. The temperatures of different years differ very little near the equator, but they differ more and more as you approach the poles.

325. It ſcarce ever freezes in latitudes under 35°, except in high ſituations; and it ſcarce ever hails in latitudes higher than 60°.

326. In latitudes between 35° and 60°, in places adjacent to the ſea, it generally thaws when the ſun's altitude is 40° or upwards; and ſeldom begins to freeze, until the ſun's meridian altitude is below 40°.

327. The greateſt cold in all latitudes in our hemiſphere, is generally about half an hour before ſun-riſe. The greateſt heat in all latitudes between 60° and 45° is about half paſt 2 o'clock in the afternoon; between latitudes 45° and 35°, about 2 o'clock; between latitudes 35° and 25°, and about half-paſt 1 o'clock; and between latitude 25° and the equator, about 1 o'clock. On ſea, the difference between the heat of day and night, is not ſo great as on land, particularly in low latitudes.

328. In all latitudes, January is the coldeſt month. July is the warmeſt month in all latitudes above 48°; but in lower latitudes, Auguſt is the warmeſt. The temperature of April approaches more nearly to the mean annual temperature, than any other month.

329. In the higheſt latitudes, we often meet with an heat of 75° or 80°; and in latitudes 59° and 60° that heat of July is frequently greater than in latitude 51°.

330. All countries lying to the windward of high mountains, or extenſive foreſts, are warmer than thoſe to the leeward in the ſame latitude.

331. The vicinity to the ſea is another circumſtance which

which affects the temperature of a climate; as it moderates the heat from the land, and brings the atmosphere down to a standard best fitted to the human constitution. In our hemisphere, countries which lie to the south of any sea, are warmer than those that have the sea lie to the south of them, because the winds that should cool them in winter are mitigated by passing over the sea; whereas those which are northward of the sea, are cooler in summer by the breezes from it. A northern or southern bearing of the sea, renders a country warmer than an eastern or western bearing.

332. Islands participate more of temperature arising from the sea, and are therefore warmer than continents.

333. The soils of large tracts of land have their share in influencing the temperature of the country: Thus, stones and sand, heat and cool more readily, and to a greater degree, than mould; hence, the violent heats in the sandy deserts of *Arabia* and *Africa*; and the intense cold of *Terra del Fuego*, and other stony countries in cold latitudes.

334. Vegetables considerably affect the temperature of a climate. Wooded countries are much colder than those which are open and cultivated.

335. Every habitable latitude enjoys a heat of 60° at least, for two months and this is necessary for the growth and maturity of corn. The quickness of vegetation in the higher latitudes proceeds from the time the sun is above the horizon. Rain is but little wanted, as the earth is sufficiently moistened by the liquifaction of the snow that covers it during the winter. In this we cannot sufficiently admire the wise disposition of Providence.

336. It is owing to the same provident hand that the globe of the earth is interfected with seas, and mountains, in a manner, that seems, on its first appearance, altogether irregular and fortuitous; presenting to the eye of ignorance, the view of an immense ruin: but when the effects of these seeming irregularities on the earth are carefully inspected, they are found most beneficial, and even necessary to the welfare of its inhabitants; for to say nothing of the advantages of trade and commerce, which could not exist without seas, we have seen that it is by their vicinity, that the cold of higher latitudes is moderated, and the heat of the lower. It is by the want of seas, that the interior parts of *Asia*, as *Siberia* and *Great Tartary*, as well as those of *Africa*, are rendered almost uninhabitable; a circumstance which furnishes a strong prejudice against the opinion of those, who think those countries were the original habitations of man. In the same manner, mountains are necessary; not only as the reservoirs of rivers, but as a defence against the violence of heat in the warm latitudes; without the Alps, Pyrenees, Apennine, the mountains of Dauphine, Auvergne, &c. *Italy*, *Spain*, and *France* would be deprived of the mild temperature which they now enjoy. Without the Balgate Hills, or Indian Apennine, *India* would have been a desert. Hence, *Jamaica*, *St. Domingo*, *Sumatra*, and most other islands between the tropics, are furnished with mountains, from which the breezes proceed which refresh them.

337. The annual heat of *London* and *Paris* is nearly the same; but from the beginning of April to the end of October, the heat is greater at Paris than at London. Hence, grapes arrive at greater pefection in the neighbourhood of Paris than about London.

338. The following table contains a comparison of the temperature of *London* with several other places. The first column contains the place; the second, the annual temperature; the third, the temperature of January, that being the coldest month; and the fourth, the temperature of July; that at London, as the standard, being estimated at 1000. The degree of *cold* is estimated in the third column; and the degree of *heat* in the fourth and second.

Places.	An. Temp.	Temp. Jan.	Temp. July.
London - - - -	1000	1000	1000
Paris - - - -	1028	1040	1037
Edinburgh - - -	923	1040	914
Berlin - - - -	942		
Stockholm - - -	811	1583	964
Petersburgh - - -	746	3590	1008
Vienna - - - -	987	1305	1037
Pekin - - - -	1067	1730	1283
Bourdeaux - - -	1090	925	1139
Montpelier - - -	1170	850	1196
Madeira - - - -	1319	559	1128
Spanish Town, in Jamaica - -	1557		
Madrass - - - -	1565	491	1349

339. At

339. At *London*, by a mean of the obſervations made at the Royal Society from 1772 to 1780, it appears that the mean annual temperature is 51°, 9, or in whole numbers, 52°; and the monthly temperature is as follows:

January	35°,9
February	42,3
March	46,4
April	49,9
May	56,61
June	63,22
July	66,3
Auguſt	65,85
September	59,63
October	52,81
November	44,44
December	41,04

The greateſt uſual cold is 20°, and happens in January; the greateſt uſual heat is 81° and happens generally in July.

The limits of the annual variation are 2°,5, that is, 1° above, and 1°,5 below the mean.

The greateſt variations of the mean temperature of the ſame month in different years, are as follows:

January	6°	July	2°
February	5	Auguſt	2
March	4	September	3,5
April	3	October	4
May	2,5	November	4
June	2	December	3

Hence it appears, that the temperatures of the ſummers differ much leſs than thoſe of the winters.

The moſt uſual variations of temperature within the ſpace of 24 hours in every month, are,

January	6	July	10°
February	8	Auguſt	15
March	20	September	18
April	18	October	14
May	14	November	9
June	12	December	6

340. At *Peterſburgh*, latitude 59°. 56′, longitude 30°. 24′ E. the mean annual temperature is 38°,8, from the mean of 6 years the greateſt cold obſerved was that at which mercury freezes, that is, 39° below 0°; but the greateſt mean degree of cold for ſeveral years was 25° below 0°. The greateſt ſummer heat, on a mean, is 79°, yet once it amounted to 94°. It ſcarce ever hails at this place.

341. In latitude 79°. 50′, Lord MULGRAVE obſerved the greateſt heat for two days to be 58°, and the leaſt 46°. Mr. MARTIN obſerves, that the weather in the polar regions is very unſteady: one hour it blows a violent ſtorm, and in the next there is a dead calm; neither does it blow long in any one point, but ſometimes from every point within 24 hours. After a calm, the north wind ſprings up firſt; the ſky is ſeldom perfectly clear, and ſtorms are much more frequent than in lower latitudes.

342. In *Europe*, unuſual cold in ſummer may ariſe, either from a long continuance of eaſterly or northerly winds, or from frequent and heavy rains, which are followed by great evaporations, or from a long continuance of cloudy weather in June and July, which prevents the earth from receiving its proper degree of heat.

343. The cauſes of unuſal cold in winter may be theſe. 1ſt, *Unuſual cold in the preceding ſummer*. For the heat in the winter being in a great meaſure derived from the earth, if this be deprived of its uſual heat, the want of it muſt be perceived in winter. The cold of January 1709 was the ſevereſt, long known in Europe; and Mr. DERHAM remarked, that the preceding June was ſo cold, that his thermometer was near the freezing point on the 12th of that month, and the quantity of rain was much greater than uſual. Mr. WOLF made the ſame obſervation in *Germany*. 2dly. *Heavy rains followed by eaſterly or northerly winds*. This circumſtance produces great cold at any time, on account of the great evaporation which then takes place by theſe dry winds. It took place in October 1708, as Mr. WOLF obſerved; and an intenſe cold immediately followed. 3dly. *Weſterly or ſoutherly currents, in the upper regions of the atmoſphere, whilst eaſterly or northerly winds prevail in the lower*. For the warm currents are deprived of their moiſture by the cold of the ſuperior regions; and this deſcending in the form of ſnow, cools the inferior ſtrata below their uſual temperature: this circumſtance alſo took place in 1709, when the cold was greateſt. 4thly. *The arrival of Siberian, or American winds*. *Siberia* is 2800 miles eaſt of *Lond*; but according to Mr. SMEATON's computation, a common high wind moves at the rate of 35 miles in an hour, and therefore may paſs to us in 3 days from *Siberia*, and preſerve much of its original degree of cold. The winds from *America* may alſo arrive in a few days; but their rigour will be abated by paſſing over the ſea; but if the ſea have been previouſly cooled by northerly winds, the weſterly winds may prove very cold. Mr. DERHAM, on comparing his journals with thoſe of Mr. ROBIE in *New England*, found, that after a few days the *American* winds paſſed into *England*. The wind in 1784 was equally ſevere in *America*, as in *Europe*. 5thly. *The fall of a ſuperior ſtratum of the atmoſphere*. This will happen when a cold wind in the upper regions of the atmoſphere paſſes over a country, the lower ſtatra of whoſe atmoſpere are lighter; and hence a low ſtate of the barometer generally precedes ſuch extraordinary cold. It is probably for this reaſon, that *Holland* oftener experiences a greater degree of cold, than other countries under higher latitudes; for being a moiſt country, its atmoſphere abounds more in vapours, which renders it ſpecifically lighter; thus, during the great cold of January 1783, the barometer was lower than it had been known to be for 50 years before, during that month: and MUSCHENBROCK remarked, that

that in winter, when the mercury in the barometer descends, the cold increases.

344. Land is capable of receiving much more either heat or cold, than water. In winter when the surface of water is much cooled by contact with the colder air, the deeper and warmer water at the bottom, being specifically lighter, rises and tempers the top, and as the colder water constantly descends during the winter, in the following summer the surface is generally warmer than at greater depths; whereas in winter it is colder; hence it has been remarked, that the sea is always colder in summer and warmer in winter, after a storm, the water at great depths being mixed with that at the surface. Of the following observations, the three first were made by Lord MULGRAVE, the three next by WALES and BAYLEY, and the other by Mr. BLADH. The third column expresses the heat of the air over the surface of the sea; the fourth expresses the depth of the sea in *feet*; the fifth expresses the heat of the sea at that depth, and the sixth expresses the heat of the sea at the surface.

Latitude.	Time.	Heat of Air.	Depth.	Heat of Sea	Ht. of Surface
67° N.	June 20	48.5	4680	26	
78 N.	30	40,5	704	31	
69 N.	August 31	59,5	4038	32	
0	Sept. 5	75,5	510	66	74
24 S.	26	72,5	480	70	70
34. 44′ S.	Oct. 11	60,5	620	57	59
57 N.	Jan. 8	46	6	40	37
	10	43,6	50	43,6	43.6
55. 40′ N.	20	47	110	51,5	40
39. 30 N	28	53	110	59	59
2. 55 N.	Feb. 25	81	58	81	81
2. 50 N.	26	83	110	81	84,5

345. As the water in the high northern and southern latitudes, is, by cold, rendered heavier than that in lower warm latitudes, hence arises a perpetual current from the poles to the equator, which sometimes carries down large masses of ice, which cool the air to a great extent. Inland seas of great extent have been frozen in very severe winters. In 1668, the *Baltic* was so firmly frozen that CHARLES XI. of *Sweden*, carried his whole army over it; and the *Adriatic* was frozen in 1709 The temperatures of land and water differ more in winter than in summer; for in winter, inland countries, from lat. 49° to 70° are frequently cooled down to 0°, 50°, and some to 70° below the freezing point; whereas, the sea below lat. 76° is not colder than 4° below that point in the northern hemisphere, except some narrow seas in the north *Pacific Ocean*; but in summer, no considerable extent of land is heated to more than 15° or 20° above the temperature of the sea, stony and sandy deserts excepted.

346. The temperatures of the smaller seas, in general, if not surrounded with high mountains, are a few degrees warmer in summer, and colder in winter, than the standard ocean; in high latitudes they are frequently frozen.

347. The *white* sea is frozen in the winter.

348. The *Gulph of Bothnia* is in a great measure frozen in winter; but in summer it is sometimes heated to 70°. Its general temperature in July is from 48 to 56°.

349. The *German* sea is about 3° colder in winter and 5° warmer in summer, than the *Atlantic*.

350. The *Mediterranean* sea is, for the greater part of its extent, warmer both summer and winter, than the *Atlantic*, which, for that reason, flows into it. It is sometimes frozen in the neighbourhood of *Venice*.

351. The *Black* sea is colder than the *Mediterranean*, and flows into it.

352. The *Caspian* sea is situated in the vicinity of high mountains, and is in a great measure frozen in winter. Its level is said, by PALLAS, to be lower than the ocean.

353. Some idea may be formed what altitudes on the surface of the globe are accessible to man, by considering the height above the sea of the inferior line of perpetual snow. In the middle of the torrid zone, it appears from Mr. BOUGUER's observations, to be elevated 5201 yards, and 4476 about the tropics. In middle latitudes, there is constant snow at the height of 3309 yards. In lat. 80° north, Lord MULGRAVE found the inferior line of snow to be at the height of 400 yards: whence we may conclude, that at the poles, there is constant snow upon the surface of the earth.

On

On the Divisions of the Surface of the Earth.

354. The surface of the earth contains *land* and *water*. The great collection of water is called the *sea*, or the *ocean*; and this is divided into three principal parts; the *Atlantic* Ocean, which divides *Europe* and *Africa* from *America*; the *Pacific* Ocean, or *great South Sea*, which divides *Asia* from *America*; and the *Indian* Sea, which lies between *Africa* and *Malacca*, *Sumatra*, *Java*, *New Holland*, &c. Besides these, there are others which take their names from the countries against which they are situated; as the *Irish* Sea, the *German* Sea. There is also the *Mediteranean* Sea, dividing *Europe* from *Africa*; the *Black* Sea; the *Caspian* Sea, which is not connected with the other Seas; the *Red* Sea, &c. &c.

355. A *bay* or *gulf*, is a part of the Sea running into the land, so as to have a considerable portion of it, more or less according to circumstances, bounded by shores; as the bay of *Biscay*, the bay of *Bengal*, *Hudson's* bay, *Cardigan* bay; the gulf of *Venice*, the gulf of *Mexico*, the gulf of *Japan*, &c. &c. If the extent into the land be but small, it is called a *creek*, a *haven*, or a *road*.

356. A *strait*, or *straight*, is a narrow part of the sea running between two countries, and connecting two seas; as the straits of *Dover*, the straits of *Gibraltar*, the straits of *Sunda*, the straits of *Magellan*, &c. &c.

357. A considerable body of inland fresh water, is called a *lake*; as the lake of *Geneva*, lake *Ontario*, lake of *Derwent*, &c. &c.

358 A considerable stream of inland water which runs into the sea, is called a *river*; and smaller streams which run into a river, are called *brooks*.

359. A *current* is a stream of water upon the sea. Under the equator there are some very violent ones, against which a ship cannot make any way. There is one which carries a ship very swiftly from *Africa* to *America*, but it cannot return the same way. Governor Pownal observes, that this current performs a continual circulation, setting out from the coast of *Guinea*, crossing over the *Atlantic*, setting into the gulf of *Mexico* by the south, and sweeping round by the bottom of the gulf, it issues on the north side, and goes along the coast of *North America* till it arrives at *Newfoundland*, where it is turned back across the Atlantic to the coast of Europe, and thence southward to the point from which it sets out. In *St. George's Channel* there is a current which usually sets in eastward. From the *Baltic* a current sets into the *British Channel*. It is generally allowed, that there is always a current setting round the Capes of Finisterre and Ortegal into the bay of Biscay; and Mr. Rennell has discovered that this current is continued, and passes about N. W. by W. from the coast of France, to the westward of Scilly and Ireland. In crossing the Atlantic therefore for the English Channel, he advises the navigator to keep in the parallel of 48°. 45', at the highest, left the current should carry him upon the rocks of Scilly. From an ignorance of this current, many ships have been lost on those rocks.

360. A very great extent of land is called a *continent*, of which there are two; one contains *Europe*, *Asia* and *Africa*, and the other contains *America*; and these are called the four quarters of the world; the former is also called the *eastern*, and the latter the *western* continent.

361. A small extent of land surrounded by the sea, is called an *island*; as the island of *Great Britain*, the island of *Jamaica*, the island of *Java*, &c. &c.

362. If land run out from the main land, and be joined to it by a narrow tract of land, the land so running out is called a *Peninsula*, or almost an island; and the narrow tract is called an *Isthmus*.

363. If the land project far into the sea without an isthmus, it is called a *promontory*, the end of which is called a *cape*.

On the Component Parts of the Earth.

364. The two grand divisions of the earth are what are usually called *land* and *water*. The subdivisions may be as follows: *earths* and *stones*; *salts*; *inflammable* substances; *metalic* substances.

365. Earths and Stones. Mineralogists divide these into *calcareous*, *ponderous*, *magnesian* or *muriatic*, *argillaceous*, and *siliceous*. All stones and earths consist of these substances, either singly or mixed, or chymically combined, together with saline, inflammable and metalic substances, for they are seldom found pure. They are nearly insoluble in water, and have their specific gravities between 1 and 5, that of water being 1.

366. *Calcareous* earth, when freed from the carbonic acid by means of heat, and rendered pure from all other substances, constitutes *lime*. Its specific gravity is about 2,3 It combines with all acids, and is easily soluble in the nitrous or marine, and forms deliquescent salts. There are a great many specimens of this earth; as limestone, chalk, selenite, island crystals, almost all kinds of spars, whether transparent or opaque, and many kinds of marble; all these consist of this earth combined with some acid. To these we may add, Ketton stone, Portland stone, Purbeck stone. Vegetable and animal earths are found to be calcareous; the latter, purely so; and the former for the most part, with a mixture sometimes of the calces of iron and manganese; but the greater part of the substances of vegetables is water. According to some late experiments, 33 pounds of oak afforded only 3 drachms of ashes. Hence we see why clay is unfavourable to vegetation, and how calcareous earth is introduced into the bodies of animals.

367. *Ponderous* earth, or *barytes*, has its specific gravity about 4. Its specimens are the ponderous spar, or marmor metallicum, commonly known by the name of Cawk. It combines with acids, and with the nitrous and marine it forms salts that do not deliquesce. This earth combined with the ærial fluid, has been found at Alston Moor, in Cumberland, and resembles alum.

368. *Magnesian* earth has its specific gravity about 2.33. It combines with acids; and the specimens are steatites, soap rock, French chalk, asbestos, and talk. Epsom salt is also a combination of this earth with vitriolic acid.

369. *Argilla*.

369. *Argillaceous* earth, or *clay*, has its specific gravity not above 2. It combines with acids, and with the vitriolic it forms alum. It imbibes water very strongly, and, capable of being moulded into various forms, it is of great use in the arts and manufactories, for the essential ingredient in all kinds of pottery, is clay; the English stone ware is composed of pipe clay and ground flints; the yellow Queen's ware is made of the same materials, but in different proportions. China is a semivitrified earthen ware of an intermediate nature between common wares and glass. Chinese ware is composed of two ingredients, one a hard stone called *petuntse*, and the other called *kaolin*. This earth contracts very much by heat, and thence it has been made use of as a measure of very great heats, by considering the different degrees of contraction. The natural specimens are, boles, clays, marles, slates, mica, gems, &c.

370. *Siliceous* earth has its specific gravity 2,65. It is called crystalline, or vitrifiable earth, and combines with no acid, except the sparry. Extreme hardness is one of its properties, so that stones, in which it predominates, as flint, will strike fire with steel. It may be dissolved by fixed alkalis, either in the dry or wet way. Its specimens are, crystal, which is one of the purest, quartz, flints, onyx, jasper, wetstone, sand and gravel, &c. The precious stones are principally composed of argillaceous and siliceous earths. BERGMAN obtained from 100 parts of the following precious stones:

	Clay	Flint	Lime	Iron
Emerald -	60	24	8	6
Sapphire -	58	35	5	2
Topaz -	46	39	8	6
Hyacinth -	40	25	20	13
Ruby - -	40	39	9	10

371. Mr. KIRWAN observes, that the diamond and plumbago, cannot properly be arranged under the classes of minerals, earths, nor inflammables; but diamond has been since assigned to the latter class. A diamond is transparent, often colourless, strikes fire with steel, cuts the hardest crystals, and even rubies, being the hardest of all bodies: Its specific gravity is about 3,6. No acid but the vitriolic can affect it. In a heat somewhat greater than that in which silver melts, a diamond is entirely volatilized and consumed. Plumbago has its specific gravity from 1,987 to 2,267. It is insoluble in mineral acids. The substance is black without, but bluish white when first cut. It is used for pencils.

372. SALTS are those substances which are fusible, volatile, soluble in water, not inflammable, and sapid when applied to the tongue. In their most simple state it is a white, brittle, and in some measure a transparent mass. They are simple and compound. Simple salts are acids and alkalis; and from their union a compound salt is formed, called neutral. Earths and metals will also unite with them and form compound salts.

373. *Acids* are generally fluid, and one mark by which they may be discovered, is their property of changing to a red, the infusion of violets. They are distinguished into mineral, vegetable, and animal.

374. *Mineral* acids are the ærial, the vitriolic, the marine, the nitrous, the sparry, the succinous, the phosphoric, the molybdenous, the arsenical, the tungstenic, and the sedative.

375. *Vegetable* acids are vinegar, the acids of tartar, of sugar, of sorrel, of lemons, and of benjamin.

376. *Animal* acids are, acids of milk, of sugar of milk, of ants, of tallow, of Prussian blue, and the acidum perlati.

377. *Alkalis* are of two sorts, fixed and volatile; and the fixed are either vegetable or mineral. The mineral fixed alkali is met with in an impure state in kelp, barilla, soda. The vegetable fixed alkali is met with in an impure state in salt of tartar, pot-ash, pearl-ash, &c. The volatile alkali is never met with but as compounded with other bodies. It is sold in shops under the name of smelling salts. Alkalis change the blue infusion of violets to green.

378. INFLAMMABLES. Under this head are included those substances which are inflammable, and which do not come under the denomination of earths, salts, or metalic ores, and have general characters perfectly distinct from them. Of these, some are fluid, and some solid; the specific gravity of the latter never exceeds 2,5, and the former are the lightest of all bodies.

379. These substances are, inflammable air, or fire damp, such as is frequently found in coal-pits and mines, and this will burn when mixed with twice or thrice its bulk of common air; also, hepatic air, petrol, Barbadoes tar, mineral tallow, Scotch coal, Newcastle coal, Cannel coal, Kilkenny coal, amber, copal, sulphur, brimstone, &c.

380. Cannel coal burns with a bright light, and is so hard, that it is used to make snuff boxes, buttons, &c. Newcastle coal will cake and become cinders. Scotch coal burns to a white ash. Kilkenny coal burns with less flame and smoak than Cannel coal, and more slowly, though intensely. The earth in this coal does not exceed $\frac{1}{2}$ of its weight; and its specific gravity is about 1,4. Wherever coals exist, slates are found near them; and salt or mineral springs in the neighbourhood.

381. METALS. These substances are opaque bodies, whose specific gravities are above 5. They are all conductors of electricity, and the best of any substances. They are soluble in nitrous acid, or in aqua regia; and all precipitable in some degree by caustic alkali. There are 17 metalic substances; gold, platina, silver, copper, iron, lead, tin, mercury, zinc, regulus of antimony, regulus of arsenic, bismuth, cobalt, nickel, regulus of manganese, and regulus of molybdena. By the action of fire and air, all metals, except gold, silver and platina, may be reduced to a substance called a *calx*, and they are then said to be calcined. The calx is heavier than the metal, owing to the pure air which is imbibed during the operation. Certain metals easily combine together; and hence they are

are ufed for *foldering*: Thus, *tin* is a folder for *lead*; *brafs*, *gold*, or *filver*, is a folder for *iron*.

382. Gold, filver, platina, and mercury, are called *perfect* metals, becaufe when calcined, they recover their phlogifton without the addition of any phlogiftic fubftance. Copper, iron, lead, and tin, are called *imperfect* metals, becaufe they cannot be entirely reduced without the addition of fome phlogiftic fubftance. All thefe however (even mercury when folid) are malleable to a certain degree. The other eight are called *femi*-metals, and are fcarcely at all malleable.

383. *Gold* has a fpecific gravity fometimes as far as 19,64; and is foluble only in aqua regia. If expofed to the utmoft heat, it lofes none of its weight. In its native ftate it is found in lumps, or in vifible grains mixed with fand, or embodied in earths or ftones. When pure, it is almoft as foft as lead, and is neither elaftic nor fonorous; an alloy of filver and copper, each one part to 22 of pure gold, will make it as hard as our coin.

384. *Silver* when pure has a fpecific gravity of 11,095; and is foluble in concentrated vitriolic acid with the affiftance of heat, and in moderately diluted nitrous acid without heat. Native filver is found in a granular, lemellar, filamentous, capillary, abforbent, or cryftalized form, in various earths and ftones. Alfo in feparate maffes. Pure filver is too foft to be ufed without alloy. In the Britifh coinage, 15 parts of filver are alloyed with one of copper.

385. *Platina* when pure has its fpecific gravity very nearly 23. It is found only in the gold mines at *Peru*, and comes to us in the form of large fmooth grains, of an irregular figure, intermixed with quartz, and a ferruginous fand. It is foluble only in aqua regia, or dephlogifticated marine acid; and is about as hard as fteel.

386. *Mercury* in its pure ftate has a fpecific gravity of about 13,6, and its liquidity diftinguifhes it from all other metals. Native mercury is found flowing from a fhiftofe or quartzy matrix, mixed with fome other metals. In *Sweden* and *Germany* it is found united to filver in the form of a fomewhat hard and brittle amalgam. It has alfo been found diffufed through maffes of clay, and fome particular kind of ftones. It is readily diffolved in nitrous acid, and combines with almoft all metalic fubftances.

387. *Copper* has a fpecific gravity from 8,7 to 9,3. It is foluble in acids, alkalis, and neutral falts. Native copper is found either in grains, or in large folid lumps, or in a foliated, capillary, arborefcent form, or cryftalized in quadrangular pyramids, or in clay, quartz, &c. It mixes with the other metals, and is confiderably hard, and malleable. *Brafs* is a mixture of pure copper, with a fourth part of pure zinc. Copper mixed with tin, form *gun metal*. Copper alloyed with tin, make *bell-metal*. Copper and lead make *pot-metal*. *Bronze* is a compound of copper and tin, to which zinc is fometimes added. *Pinchbeck* is a kind of brafs made in imitation of gold.

388. *Iron* has its fpecific gravity from 7,6 to 8. It is foluble in all acids, and is more difficult to be fufed than any of the metallic fubftances, platina and manganefe excepted. Native iron exifts in many places. Its ores are either purely calciform, as in ochres; or the calces are mixed with earths, as in fpars, jafper, &c. Or the iron is mineralized with fulphur, as in pyrites. *Steel* is ufually made by cementation from the beft forged iron, with matters of the inflammable kind. Caft iron is not malleable, and fo hard that a file will not touch it.

389. *Lead* has a fpecific gravity from 11,3 to 11,479. It is more or lefs foluble in all acids; foft, and eafy of fufibility. Native lead is faid to have been found in *Monmouthfhire* in fmall pieces, and in fome other places. The ores of lead are moftly found amongft calcareous and ponderous earths. It is alfo found mineralized. By heat and air, lead is converted into *minium*, or red lead. The calces of lead are ufed for painting. Lead is ufed as a preparation of enamels, and of porcelain as a flux, and makes the bafis of the glazing of pottery wares.

390. Tin has its fpecific gravity from 7 to 7,45. It diffolves in fpirit of falt or aqua regia; is not quite fo foft as lead; and melts the moft readily of all metals. Native tin has been found in *Cornwall* in the form of thin flexible laminæ iffuing out of a matrix of quartz, or regularly cryftalized. The ores of tin are generally calces of that metal in a cryftalized form, bedded moftly in a filiceous matrix. *Pewter* is a mixture of tin and lead.

391. *Regulus of antimony* in its pure ftate has its fpecific gravity 6,86. Its colour is a filvery white; very brittle; and is foluble in a confiderable degree by feveral acids. The moft common ore of this metal is antimony.

392. *Regulus of arfenic* has its fpecific gravity 8,31. Its colour is bright yellowifh white, but grows black by expofure to the air. It is very brittle; is eafily foluble in the nitrous acid; with more difficulty in the vitriolic; and fcarce at all in the marine. The ores are found principally in Saxony. It is a ftrong poifon, and is foluble in 80 times its weight of water.

393. *Bifmuth* has its fpecific gravity from 9,6 to 9,7. Its colour is reddifh, or yellowifh white, and it is very brittle. It is foluble in aqua regia; fcarcely in the vitriolic acid; and ftill lefs in the marine. Its ores are generally found mixed with cobalt.

394. *Cobalt* has its fpecific gravity about 7,7. It is of a blueifh grey colour; is very brittle; and its fufibility is nearly as that of copper. Its calx melted with borax, pot-afh, and white filiceous fand, gives a blue glafs. It is never found native.

395. *Nickel* has its fpecific gravity from 7,421 to 9. Its colour is reddifh white, and it is very hard; and its fufibility is nearly as that of copper. It diffolves in nitrous acid, and aqua regia. It is found native, and alfo with other metals.

396. *Regulus of manganefe* has its fpecific gravity 6,85. Its colour is dufky white; it is harder than iron, and very brittle; and is foluble in acids. It is not found native. If a globule of microcofmic falt be melted on a piece of charcoal, and a fmall piece of the black calx of this metal be added, it forms a blueifh red glafs.

397. *Molybdena* has its specific gravity 5,60. It is of a lead colour, resembling plumbago. No acids act on it, but the arsenical and nitrous.

398 Chrome, sylvanite, titanium, and other newly discovered semi-metals, are rather objects of curiosity than of utility.

399. Mr. Kirwan divides mountains into *entire, stratified, confused*, and *volcanic*.

400. *Entire* mountains are formed of stone, without any regular fissure, and mostly homogeneous. They consist of granite, flagstone, limestone, gypsum, &c. and of iron ore.

401. *Stratified* mountains are those which are regularly divided by joints or fissures.

402. *Confused* mountains, are those of a confused structure, consisting of all sorts of stones heaped together, with sand, clay and mica; but with scarcely any ores.

403. The strata of which mountains consist, are either *homogeneous*, or *heterogeneous*.

404. *Homogeneous* consist chiefly of argillaceous stones, or siliceous; or of both, the one behind the other. Sometimes of limestone; and sometimes the argillaceous are covered with granite, and lava. These mountains are also the chief seat of metalic ores, running in veins and not in strata.

405. *Heterogeneous* consist of alternate strata of stones, earths, metalic ores, and sometimes lava, coal, bitumen and petrifactions are here found. Also, salts, gold in sandy strata, iron and copper in strata, lead ore, &c.

406. *Volcanic* mountains appear to have some connection with the sea, for they are generally in its neighbourhood. On the top there is a hollow like an inverted cone, called the crater, through which the lava generally passes; though sometimes it bursts out on the sides, and runs a red hot river of matter or lava. These eruptions are frequently attended with thunder, lightning, and earthquakes. In 1779 the lava of Mount Vesuvius almost destroyed the town of *Torre del Greco*, the inhabitants of which had scarcely time to save themselves. From the immense quantity of matter thrown up at different times, without diminishing their apparent bulk, we may conclude the seat of these fires to be many miles under ground. The explosion and eruption of the melted matter probably arise from water getting down upon the fire, and then being converted into an elastic vapour, the force of which is known to be several thousand times greater than that of gunpowder. If the superincumbent weight be too great for the force, it then may produce earthquakes without an eruption. The substances ejected are, phlogisticated, fixed, and inflammable air, water, ashes, pumice stones, stones that have undergone no fusion, and lava. Stones of 10 feet diameter are sometimes thrown to great distances.

407. *Petrifactions* are of shells found on or near the surface of the earth; of fish deeper, and of wood the deepest. Those substances which resist putrefaction the most, are frequently found petrified; and those that are most apt to putrify are seldom found petrified. Petrifactions are most commonly found in strata of marl, chalk, or clay; but they sometimes are found in gypsum, pyrites, ores of iron, copper and silver. They are formed in climates where their originals could not have existed.

408. Water, perfectly pure, is transparent, without colour, taste, or smell. When exposed to a certain degree of cold, it becomes a solid; and when exposed to a certain degree of heat, it is dissipated in vapour. It is incompressible by any human force; but by heat and cold its bulk is increased and diminished. In an open vessel, it is incapable of receiving above a certain degree of heat; but in a confined vessel, the heat may be increased beyond that. Till lately, water was thought a simple substance, but Mr. Cavendish has discovered that it is a compound of two airs, inflammable and dephlogisticated, or vital air; for if these airs be burned together, water is produced, which is said to be equal in weight to that of the quantities of air made use of; it is therefore supposed, that during combustion, the latent heat that maintained the ærial form is given out.

409. Rain is the purest natural water. But water has the capacity of holding in solution a variety of substances, as earths, salts, and metals; and the water of springs receives its name from the substance it holds in solution. These waters however may be obtained pure by distillation. The substances held in solution by water, are;

410. *Fixed air*. This gives a briskness to waters, similar to that of fermenting liquors, which is chiefly observed when the water is poured from one vessel to another. It is very volatile, and escapes when the water is exposed to the air.

411. *Vitriolic, nitrous, and muriatic acid*. One or other of these exist in almost all mineral waters; but sometimes the vitriolic exists in a separate state, and gives the water an acidity.

412. *Alkaline salt*. This is found in many waters in Hungary, Tripoli, and other countries. It is usually the fossil alkali which is combined with fixed air in the *Seltzer* waters; and with the mineral acids in others. The vegetable and volatile alkalis rarely are found in mineral waters.

413. *Neutral salts*. These are not uncommon in springs. Common salts, nitre, and vitriolated magnesia, are most usual; the latter abounds in a spring at *Epsom*, and is called Epsom salt. Sal amoniac is found in springs in the neighbourhood of volcanoes, and burning coal mines.

414. *Earthy substances*. The calcareous earth is commonly found united with the vitriolic acid. Calcareous nitre and muriated calcareous earth are also found in springs. Waters containing only earth, or selenites, are called *hard*, and do not dissolve soap well.

415. *Sulphur*. Many waters by their smell seem to contain sulphur, though very few of them are found to afford it. These waters are generally impregnated with a sulphureous gas.

416. *Metals*.

416. *Metals.* Of these, iron is most frequent, and forms what is called the *Chalybeate* waters, and these are very common. Some waters contain copper, and more rarely zinc. Sea water contains, besides earthy and selenitic matters, a large quantity of mineral salts.

417. Of springs containing these waters, some are *cold*, and some are *hot*, sometimes almost to a degree of boiling. Mr. TISSINGTON observes, that waters flowing through a blue marl filled with pyrites, are warm; and Mr. GUETTARD has remarked, that all the hot mineral springs in *France* flow through shistus. Hence, there is no occasion to derive their heat from any subterraneous volcano, as the heat may be acquired by the waters washing the pyrites, and other like minerals, in a state of spontaneous decomposition, during which they always acquire a considerable heat.

418. Sea water has been observed to contain more salt in hot than in cold climates. The quantity of common salt in sea water, is to the quantity of water, as 3 or 4 to 100; the water is therefore far from being saturated, for water is capable of dissolving nearly a fourth part of its weight of salt. Common salt is obtained from sea water by evaporation, the water thus escaping and leaving the salt behind. The water which escapes is fresh. Hence, sea water may be rendered fresh, by adapting a tube to the lid of a common kettle, and condensing the steam in a hogshead as a receiver. Thus fresh water may be obtained at sea.

419. We will briefly note the composition of the waters in some of the most remarkable springs.

420. *Aix la Chapelle.* The waters here are hot and sulphureous. Their taste is saline, bitter, and urinous. A gallon of this water contains 2 scruples of sea salt, the same quantity of chalk, and 1¼ dram of fossil alkali. They are generally cathartic and diuretic, and promote perspiration. Their heat is from 106° to 130° of FARENHEIT's thermometer.

421. *Bath.* The waters here are hot; but have different degrees of heat in the different baths, of which there are six; the nature of the water however is the same in all. The principal baths are the *King*'s bath, the *Queen*'s bath, and the *Cross* bath. The two former raise the thermometer to 116°, and the latter to 112°. The water has a slight saline, bitterish, and chalybeate taste, and sometimes a small degree of sulphureous smell. One gallon of this water contains 23 grains of chalk, the same quantity of muriat of magnesia, 28 grains of sea salt, and 8,1 grains of ærated iron. The water operates powerfully as a diuretic, and promotes perspiration. If drunk at once in large quantities, it sometimes purges; but in small quantities it has a contrary effect.

422. *Bristol.* The springs are here called the *Hotwells.* The water at its origin is warm, and sparkling. It has no smell, and is pleasant to the taste. It raises the thermometer from 70° to 80°. One gallon contains 12¾ grains of chalk, 5¼ grains of muriat of magnesia, and 6¼ grains of sea salt.

423. *Buxton.* The hot bath here raises the thermometer to 81° or 82°. It has a pleasant taste, and contains a little calcareous earth, with a small quantity of sea salt, and a very small portion of cathartic salt. There is also a cold chalybeate water.

424. *Cheltenham.* The water here is a cathartic chalybeate, a gallon of which contains 8 drams of cathartic salt, partly vitriolated natron, partly vitriolated magnesia; 25 grains of magnesia, partly united with marine, and partly with ærial acid; and nearly 5 grains of iron combined with ærial acid; it yields also 24 ounce measures of fixed air, and 8 of azotic and hepatic air.

425. *Harrowgate.* Here are four springs nearly alike, except in the saline matter; of the three old ones, the highest contains 3 ounces of solid matter, the lowest 1½ ounce, and the middle one ¼ ounce; of the fourth, 140 grains are earth. The water is clear and sparkling, and has a strong smell of sulphur, with a salt taste, as it contains sea salt, a little marine salt of magnesia, and calcareous earth. When taken plentifully, the water is cathartic.

426. *Matlock.* Here are several springs of warm water slightly impregnated with iron. Its heat is about 69°.

427. *Scarborough.* The waters here are chalybeate and cathartic. There are two wells. In one, one gallon of water contains 52 grains of calcareous earth, 2 of ochre, and 266 of vitriolated magnesia; in the other, it contains 70 grains of calcareous earth, 139 of vitriolated magnesia, and 11 of salt water. The waters have a brisk, pungent, chalybeate taste, at both the fountains; but at one, called the cathartic, the water tastes bitterish, which is not the case with the other, called the chalybeate.

428. *Pyrmont.* This is a brisk chalybeate, abounding in fixed air; and when taken from the fountain, sparkles very much; it has a fine, pleasant, vinous taste, and a little sulphureous smell. A gallon contains 46 grains of chalk, 15,6 of magnesia, 30 of vitriolated magnesia, 10 of sea salt, and 2,6 of ærated iron. This water is diuretic, sudorific, and in large quantity it is cathartic.

429. At *Geyser, in Iceland,* there springs up a hot water, which, upon cooling, deposits siliceous earth; the water is thrown to the height of 90 feet, and after its fall, its heat is 212°.

430. About 60 yards from the shore of the island of *Ischia,* at a place called *St. Angelo,* a column of boiling water bubbles on the sea, and communicates its heat to the waters about it. It boils in winter and summer, and is of great use to the inhabitants in bending their planks for ship building. The fishermen also here boil their fish. Near the shore of this island, Sir W. HAMILTON found, when bathing in the sea, many spots where the sand was so intensely hot, as to oblige him to retire quickly.

431. Water heated to 212°, when the barometer is at 29¼, flies off in steam, and becomes an elastic fluid, at least 800 times rarer than air. This elastic fluid is the most powerful agent that can be employed in working machines. The steam may be reduced back to water, by projecting cold water amongst it. Upon the principle of generating steam and then destroying it, the steam engine is founded. When the

the ſteam is admitted under the piſton, the piſton is forced up; and when the ſteam is deſtroyed by projecting water up into the tube in which the piſton works, the piſton deſcends by the weight of the atmoſphere preſſing upon it. And ſo alternately, as long as the engine works.

432. Air. Common atmoſpherical air is an elaſtic fluid, inviſible, inſipid, inodorous, and ſonorous. According to the preſent doctrine of chemiſtry, it is principally compoſed of two airs, *dephlogiſticated*, or *vital* air, and *phlogiſticated* air. But beſides theſe, the common air muſt be combined with other airs ariſing from fermentation, putrefaction, &c. and various other ſubſtances. Dephlogiſticated air was diſcovered by Dr. Priestly, and is the pure part of the atmoſphere, or that part which is fit for reſpiration. Phlogiſticated air is totally unfit for reſpiration, as no animal can live in it. Dr. Priestly moiſtened various earthy ſubſtances, as minium, chalk, clay, &c. with ſpirits of nitre, and by diſtillation he produced an air; and he conſiders this air, which he calls *dephlogiſticated* air, as one of the conſtituent parts of the atmoſphere; and that the other conſtituent parts are *earth* and as much *phlogiſton* as is neceſſary to its elaſticity, and to render the air as pure as it is uſually found. M. Lavoisier found, that a mixture of 72 parts of phlogiſticated, and 28 parts of dephlogiſticated air, made a fluid like to our atmoſpherical air; and he concluded that the atmoſphere was a mixture of theſe two airs: for by applying ſubſtances which have an affinity to vital air, the portion of this fluid which is in the atmoſpherical air, is abſorbed, and the reſiduum is phlogiſticated air. Other chemiſts ſuppoſe that it is not a mere mixture, but a chemical compound; for as the vital air is of greater ſpecific gravity than the phlogiſticated, they ought to ſeparate, if it was only a mixture, the vital air remaining below, being of the greater ſpecific gravity, and the other aſcending. But this is not found to take place. The French chemiſts conſider dephlogiſticated air as conſiſting of a baſis called oxygene, or the acidifying principle, combined with fire. That an acid is contained in the air, is probable from the change of colour induced on the tincture of turnſole by the electric ſpark paſſing through air in contact with that liquor. And this alſo ſhows, that the electric ſpark decompoſes the air, and diſengages the acid. Common air is alſo found to diſſolve ſeveral earthy and metalic ſubſtances; indicating thereby an acidity.

433. Vital air is ſo called, becauſe it is peculiarly neceſſary for reſpiration; for animals will live much longer in this air than in the common air. All perſons who have reſpired vital air, agree that it communicates a gentle vivifying heat to the lungs, which inſenſibly extends to all parts of the body. And animals will live four or five times as long in this air, as in common air. But all animals die in phlogiſticated air. Vital air is alſo neceſſary for combuſtion; for when bodies burn in common air, it is the vital part which aſſiſts combuſtion; for there is no combuſtion without this air. If you plunge a lighted candle into a veſſel filled with this air, the flame becomes more ardent and bright, and the combuſtion is four times more rapid. Phlogiſticated air is unfit for combuſtion. That air therefore which is neceſſary for the ſupport of life, is alſo neceſſary for the ſupport of fire; and that air which is deſtructive of the former, is alſo unfit for the latter.

434. Air is neceſſary for vegetation, or the life of plants. For plants will not grow in vacuo. Dr. Priestly diſcovered, that plants will not only grow in confined air, but alſo in air vitiated by burning and reſpiration, and that ſuch air was meliorated by vegetation, and thence concluded, that vegetation was employed by nature as one mean of purifying the air, which muſt be continually corrupted by reſpiration, putrefaction, and combuſtion. M. Ingenhousz has purſued this ſubject by a courſe of experiments, and eſtabliſhed the following facts:

435. All plants poſſeſs a power of collecting foul air unfit for reſpiration; but this happens only in clear day light, or in the ſun-ſhine.

436. All plants yield a certain quantity of dephlogiſticated air in the day time, when growing in the open air, and free from ſhade.

437. Plants evaporate bad air by night, and fouls the common air which ſurrounds them; but this is far over balanced by their beneficial operation in the day.

438. Hence he concludes, that the faculty which plants have of yielding dephlogiſticated air, of correcting foul air, and improving ordinary air, is not owing to vegetation, as ſuch: for if it were, plants would exert this faculty at all times, and in all places, where vegetation goes on; which is not the caſe. A plant may thrive well in darkneſs, and ſpread round its deleterious exhalations, and have no power to correct the badneſs of the air. This operation of correcting bad air, he imputes to the influence of the light of the ſun upon the plant. He ſhows, however, that the light of the ſun by itſelf, without the aſſiſtance of plants, does not improve air, but rather renders it worſe. He found alſo, that plants have the faculty of abſorbing air, then of elaborating it, and pouring out pure vital air; but that this takes place only in the day. He alſo eſtabliſhed theſe facts:

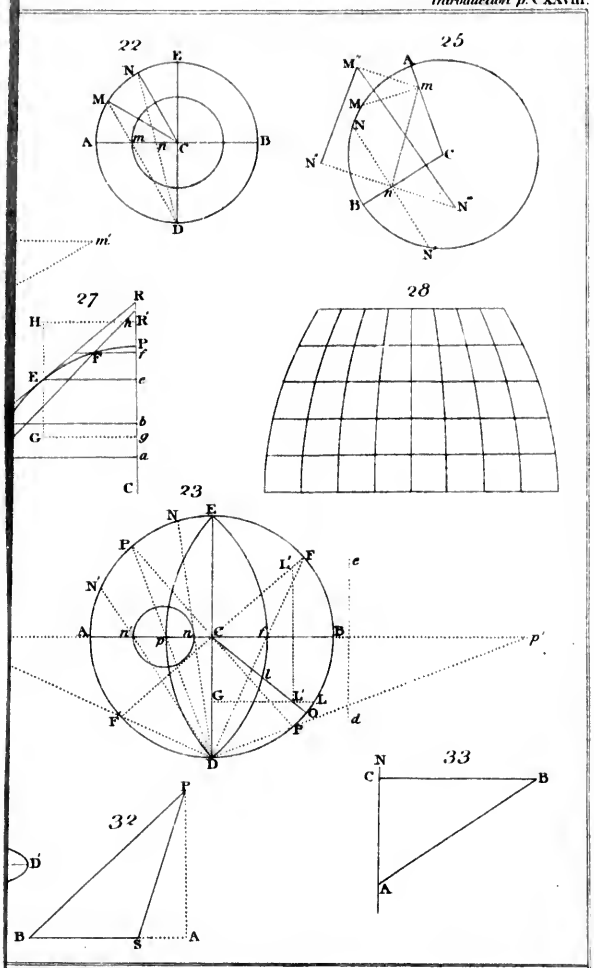
439. That flowers ooze out an unwholeſome air by day and by night, and ſpoil a conſiderable body of air about them.

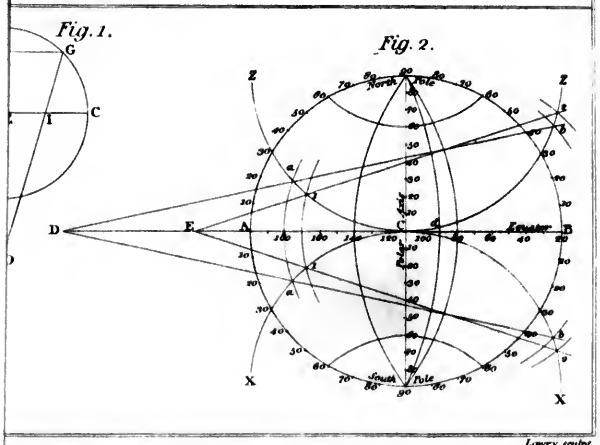
440. That all fruits exhale a deleterious air by day and by night, and ſpread a poiſonous quality through the ſurrounding air.

441. That the roots of plants, when kept out of the ground, yield, in general, bad air, and ſpoil common air at all times, ſome few excepted.

442. That dephlogiſticated air form the leaves of plants, does not exiſt in that ſtate in the plant, but that the air within the leaves is purified, and the pure part eſcapes.

443. It appears probable, that one of the great laboratories of nature for purifying the air, is placed in the leaves





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s. Strand and Longman and Rees, Paternoster Row.

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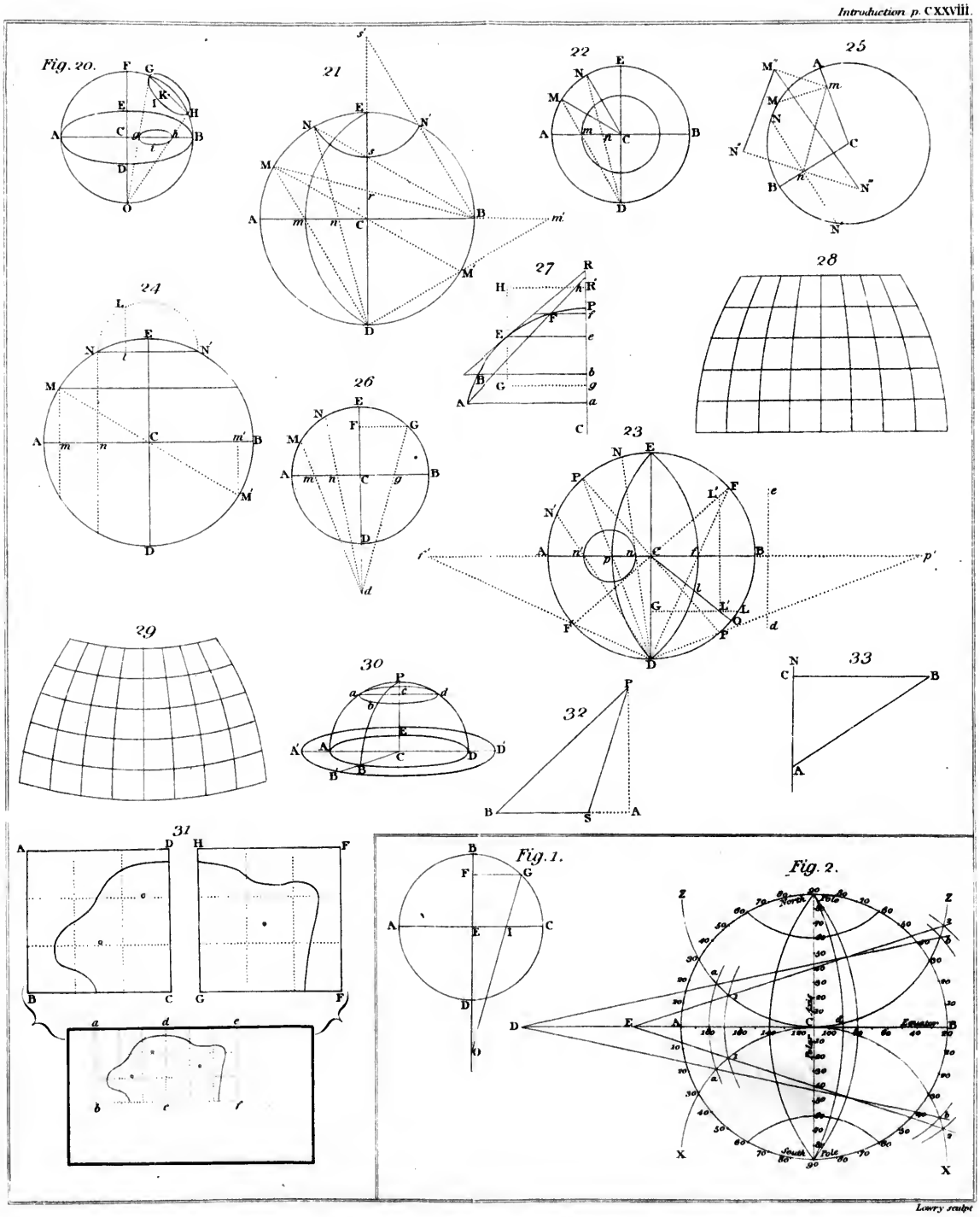

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leaves of trees and vegetables, and put in action by the influence of the light; and that the air thus purified is grown useless or noxious to the plant, and is thrown out principally by the excretory ducts, placed, for the most part, on the under side of the leaves; and this air being heavier than common air, it descends, and meliorates the air in which we breathe. But most foul airs are lighter than common air, and therefore they ascend, and escape us. These are striking instances of the wisdom and benevolence of Providence. The influence of the vegetable creation ceases in winter; but this loss is amply compensated by the diminution of the general cause of corruption, viz. Heat; as heat greatly promotes putrefaction.

444. Dr. PRIESTLY discovered that plants thrive better in foul than in vital air; and by their having the power to correct bad air, and give out again the pure part, it follows, that the vegetable kingdom is subservient to the animal; and that air rendered noxious by animal respiration, serves to plants as a kind of nourishment.

445. The air which we breathe is rendered unfit for respiration, by receiving a portion of fixed air, which is generated in our body. We consume, by each inspiration, about 30 cubic inches of air.

446. By the experiments of Dr. HALES, we know that all bodies contain a great quantity of air in a fixed, non-elastic state; and this air is rendered elastic, and expelled from the body, by heat. He found, that from a cubic inch of heart of oak, was generated 216 cubic inches of air, the weight of which was $\frac{1}{5}$ of the weight of the oak. A cubic inch of Newcastle coal gave out 360 cubic inches of air, which is nearly $\frac{1}{3}$ of the weight of the coal. As air therefore constitutes so considerable a part of some bodies, it seems that the state in which it exists in the body, may be that of a solid, and may serve as a cohesion for the other parts. There seems to be nothing in this supposition inconsistent with other properties of air, as we know that the mixtures of two airs will produce water. That the air in the body must have been in a non-elastic state, is manifest from hence, that, in the last instance, if the air which was expanded into an elastic fluid of at least 360 times its original bulk, should be compressed again into its original bulk, its elasticity would be increased 360 times, in which state, its force would be sufficient to rend a body, in which it might be confined, to atoms. With the original density, therefore, it must have existed in a state of non elasticity.

447. The airs thus produced from bodies by distillation, fermentation, &c. have different properties according to the different bodies. There is what is called the *vinous* air, arising from vegetables; *calcareous* air, or air from calcareous earths; this is called *fixed* air; *vitriolic acid* air, arising from a mixture of vitriolic acid and inflammable substances; *inflammable* air, arising from a mixture of water, vitriolic acid, and zinc, iron, &c. And airs are formed from various other combinations of substances, from which the airs take their name. The inflammable air is that with which balloons are filled. A mixture of this and common air will take fire. It is ten times lighter than the common air. All the airs thus generated, called *factitious* airs, are noxious; but most of them being lighter than common air, they ascend in the atmosphere as soon as they are formed.

448. VEGETATION. Mr. HALES, in his *vegetable statics*, has made a great number of experiments in order to establish the principles of vegetation; we shall therefore here give the result of his inquiries; with some further observations on plants, and the analogy between them and the animal creation.

449. The substance of vegetables is composed of sulphur, volatile salt, water, earth, and air.

450. Water and air enter by the roots and ascend in the respective tubes, the water forming the sap; and nature has taken care to cover the roots with a very fine thick strainer, that nothing can be admitted into them but what can readily be carried off by perspiration, vegetables having no other provision for discharging their recrement.

451. The elastic æreal fluids distend each ductile part, and by enlivening and invigorating the sap, and mixing with the other principles, they, by heat and motion, assimilate into the nourishment of the respective parts. While in this nutritive state, by the gradual cohesion of the constituent particles, they are at length formed into a firmly compacted body.

452. The sap rises all winter, but in a smaller degree than in the summer. And the perspiring matter of trees is rather actuated by warmth, and so exhaled, than protruded by the sap upwards.

453. The air enters into the vegetable, not only by the roots, but also by the trunk and leaves, especially at night, when they are changed from an expiring to an imbibing state. Part of the nourishment of vegetables arises also from the leaves plentifully imbibing dews and rain, which contain salt, sulphur, &c. the air being impregnated with these substances.

454. Leaves are also instrumental in drawing nourishment from the roots, and furnishing the young shoots with nutriment. They also contain the main excretory ducts, and separate and carry off the redundant watery fluid, which by being long detained, would turn rancid, and be prejudicial to the plant; thus leaving the more nutritive parts to coalesce.

455. The use of leaves, which are placed just where the fruit joins to the tree, is to bring nourishment to the fruit; accordingly we find that the leaves next adjoining to blossoms, are, in the spring, very much expanded, when the other leaves on barren shoots are but beginning to shoot: So provident is nature in making timely provision for nourishing the embryo fruit. The pedals of leaf-stalks are also placed where nourishment is wanted to produce leaves, shoots, and fruit; and some such thin leafy expansion is so necessary for this purpose, that nature provides small thin expansions, which may be called primary leaves, that serve to protect and draw nourishment

nourishment to the young shoot and leaf-buds, before the leaf itself is expanded.

456. A dilating spongy substance, by equally expanding itself every way, would not produce a long slender shoot, but rather a globose one; to prevent which, nature has provided several diaphragms, besides those at each knot, which are placed at small distances across the pith, thereby preventing its too great lateral dilatation. We may also observe, by the bye, that nature makes use of the same artifice in the growth of the feathers of birds.

457. The great quantity of moisture perspired by the branches of trees, during the cold winter season, shows the reason why a long series of cold north-easterly winds blasts the blossoms and tender fruit, the moisture exhaling faster than it can be supplied by the trees. Hence the use of snow in covering the leafy spires of corn, in such weather.

458. The proof we have of the utility of leaves in drawing up the sap, and the care nature takes in furnishing the twigs with plenty of them, principally near the fruit, may instruct us, on one hand, not to be too lavish in pruning them off, and to be careful to leave some on the branch beyond the fruit; and on the other hand, to be careful to cut off all superfluous shoots, as they draw away a great quantity of nourishment. Thus far Mr. HALES.

459. When a seed is sown in a reversed position, the young root turns downwards and enters the earth, and the stem bends upwards into the air. Confine a stem to an inclined position, and its extremity will soon assume a perpendicular position. Turn a branch so that the under side of the leaves may be upward, and the leaves will soon regain their natural positions. Many leaves follow the motion of the sun; in the morning their superior surfaces are towards the east; at noon, towards the south; at evening, towards the west; and during the night, or in rainy weather, these leaves are horizontal, with their inferior surfaces towards the earth. What is called the sleep of plants, affords another instance of vegetable motion. The leaves of many plants fold up in the night, and open again in the day. And it is worthy of remark, that they all dispose themselves so as to give the best protection to the young stems, flowers, buds, or fruit. Many flowers have also the power of moving. During the night, many of them are enclosed in their calixes. Some flowers, when asleep, hang their mouths towards the earth, to prevent the noxious effects of rain or dew. If a vessel of water be set within six inches of a growing cucumber, the direction of its branches will soon tend towards the water. When a pole is placed at a considerable distance from an unsupported vine, the branches will soon tend towards the pole, and twist about it. The sensitive plant possesses the faculty of motion in a remarkable degree; the slightest touch makes its leaves suddenly shrink, and, together with the branch bend towards the earth. These circumstances tend to prove, that plants are endowed with *irritability*.

460. The structure of plants, like that of animals, consists of a series of vessels disposed in a regular order. The œconomy and functions of vegetables, as well as those of animals, are the results of a vascular texture. The pith, or medullary substance of plants, resembles the spinal marrow of animals; and when the texture of either is destroyed, the plant or animal dies. The round bones of animals consist of concentric strata, which are easily to be separated; and the wood of plants consists of concentric layers of hardened vessels, which separate when macerated in water. A tree acquires an additional ring every year, and thus its age may be pretty accurately obtained. Animals and vegetables gradually expand from an embryo state, and sooner or later arrive at perfection. Some parts of animal bodies partake of the nature of vegetables. Thus, the hair, the nails, the beak, and the horn, are a species of vegetables, as appears from their total insensibility. There is a striking analogy between the eggs of animals and the seeds of plants. When placed in proper situations, they both produce young, similar to their parents. There is also a great similarity in the structure and uses of their respective organs. Many animals have seasons peculiar to their respective kinds. Some animals produce in the spring; others in autumn; and others in winter. And particular vegetables also have their respective seasons. And thus nature has wisely ordained, that the earth should always be covered with plants. Hence, by taking a general survey of the vegetable and animal kingdoms, it appears, that nature in their formation has operated upon one and the same great principle and model.

On Measures.

461. In settling the measures of different nations in respect to their relative values, we have followed what we judged to be the best authorities, and where we could procure different measures to which we could attach equal credit for accuracy, we have taken the mean; we trust therefore that the following tables will exhibit the values of ancient and foreign measures with as much accuracy as the nature of the subject will admit of. The Grecian long measures were principally taken from the human body. Thus Δακτυλος is a finger's breadth; Δωρον a hand's breadth, or four fingers; Ὀρθοδωρον the length of the hand from the upper part to the extremity of the longest finger; Σπιθαμη the length of the hand between the thumb and little finger; Πους the foot; Πηχυς from the elbow to the extremity of the fingers; Πυγων from the elbow to the second joint of the fingers; Πυγμη from the elbow with the fingers clasped; Ὀργυια from the extremity of one middle finger to the extremity of the other, the arms being extended. In these measures they were followed by the Romans, who have *digitus, palmipes, palmus, pes, passus, ulna, cubitus*, &c.

ENGLISH

English Measures of *Length*.

Inches.	Palms.	Spans.	Feet.	Cubits.	Yards.	Paces.	Fathoms.	Poles.	Furlongs.	Mile.
3										
9	3									
12	4	$1\frac{1}{3}$								
18	6	2	$1\frac{1}{2}$							
36	12	4	3	2						
60	20	$6\frac{2}{3}$	5	$3\frac{1}{3}$	$1\frac{2}{3}$					
72	24	8	6	4	2	$1\frac{1}{3}$				
198	66	22	$16\frac{1}{2}$	11	$5\frac{1}{2}$	$3\frac{2}{9}$	$2\frac{3}{4}$			
7920	2640	880	660	440	220	132	110	40		
63360	21120	7040	5280	3520	1760	1056	880	20	8	

Also, 4 inches=1 hand; 3 miles=1 league; and 60 geographical miles=1 degree=69,2 English miles.

462. The Scotch *Elwand* is divided into 37 inches, and is found equal to $37\frac{1}{2}$ English inches; therefore a Scotch inch and foot are to the English, as 185 to 180. Itinerary measure is the same in Scotland as in England. The length of the chain is 4 poles, or 22 yards; and 80 chains make a mile. The old Scotch computed miles were about $1\frac{1}{2}$ English miles.

463. The English *Ell* is $1\frac{1}{4}$ yard and is used in measuring linens imported from Germany and the low countries.

464. An English fathom is to a French toise, as 1000 to 1065,75. The toise contains 6 feet; the foot contains 12 inches; and the inch contains 12 lines. As the fathom and toise contain the same number of feet, an English foot is to a French foot, as 1000 to 1065,75.

English *Square* Measures.

Inches.	Feet.	Yards.	Paces.	Poles.	Roods.	Acre.
144						
1296	9					
3600	25	$2\frac{7}{9}$				
39204	$272\frac{1}{4}$	$30\frac{1}{4}$	10,89			
1568160	10890	1210	435,6	40		
6272640	43560	4840	1742,4	160	4	

465. Land is measured by a chain, called *Gunter's* chain, from the inventor; its length is 4 poles=22 yards =66 feet. It consists of 100 equal links, each of which is therefore 7,92 inches. Land is estimated in acres, roods and perches. An acre contains 10 square chains; therefore 10 chains in length, and 1 in breadth, make an acre, the form being supposed that of a rectangled parallelogram. A rood is one-fourth of an acre; and a perch is the fortieth part of rood, or it is a square pole. Hence, an acre contains 10×1=10 square chains=40×4=160 square poles=220×22=4840 square yards=1000×100=100000 square links. Also, 625 square links=1 square pole, or a perch; 40 perches=1 rood; 4 roods=1 acre. A square mile contains 640 acres. A *hide* of land, mentioned in the earlier part of our history, contained about 100 acres.

466. In *Scotland*, the measure of the land is regulated by the ell: 36 square ells=1 fall; 40 falls=1 rood; 4 roods=1 acre. The Scotch acre is to the English, as 10000 to 7869. The length of the chain used in Scotland for measuring land, is 24 ells=72 feet.

467. In *solid* measure, 1728 inches=1 foot; and 46656 inches=27 feet=1 yard.

468. In *wine* measure, 28$\frac{7}{8}$ solid inches=1 pint; and 231 inches=8 pints=1 gallon.

469. In *ale* measure, 35$\frac{1}{4}$ solid inches=1 pint; and 282 inches=8 pints=1 gallon.

470. In *dry* measure, 33$\frac{1}{5}$ solid inches=1 pint; and 268$\frac{4}{5}$ inches=8 pints=1 gallon.

471. In *Winchester* corn measure, 34$\frac{1}{5}$ solid inches=1 pint; and 272$\frac{1}{2}$ inches=8 pints=1 gallon; also, 8 gallons=1 bushel.

472. The *Scotch* quart contains 210 solid inches.

473. *Forty* feet of hewn, and *fifty* of unhewn timber, make a load.

Ancient Roman Measures of *Length*.

										Engl. Yds.	Ft.	Inches.
Digitus transversus,										0.	0.	0,7266
$1\frac{1}{3}$	Uncia,									0.	0.	0,9688
4	3	Palmus minor,								0.	0.	2,90639
16	12	4	Pes,							0.	0.	11,62556
20	15	5	$1\frac{1}{4}$	Palmipes,						0.	1.	2,53195
24	18	6	$1\frac{1}{2}$	$1\frac{1}{5}$	Cubitus,					0.	1.	5,43834
40	30	10	$2\frac{1}{2}$	2	$1\frac{2}{3}$	Gradus,				0.	2.	5,0639
80	60	20	5	4	$3\frac{1}{3}$	2	Passus,			1.	1.	10,1278
10000	7500	2500	625	500	$416\frac{2}{3}$	250	125	Stadium,		201.	2.	5,975
80000	60000	20000	5000	4000	$3333\frac{1}{3}$	2000	1000	8	Milliare,	1614.	1.	11,8

Of these measures, the digit, inch, palm, foot, cubit and pace, were in use amongst the architects; the foot, pace, stadium, and mile, amongst the geographers.

474. Of the ancient Roman *superficial* measure, the *jugerum*, or acre, was the unit; and this, like the *As*, *Libra*, or any other integer, they divided as follows, the jugerum being a unit answering to the *As*, and containing in Roman and English square measure

As

	Feet.	Scruples.	Engl. Roods.	Poles.	Feet.
As - -	28800	288	2	18	250,05
Deunx - -	26400	264	2	10	183,85
Dextans - -	24000	240	2	2	117,64
Dodrans - -	21600	216	1	34	51,42
Bes - -	19200	192	1	25	257,46
Septunx - -	16800	168	1	17	191,25
Semis - -	14400	144	1	9	125,03
Quincunx - -	12000	120	1	1	58,82
Triens - -	9600	96	0	32	264,85
Quadrans - -	7200	72	0	24	198,64
Sextans - -	4800	48	0	16	132,43
Uncia - -	2400	24	0	8	66,21

The *Actus major* was 14400 feet equal to a *semis*. The *Clima* was 3600 feet equal to a *sescuncia*. The *Actus minimus* was 4800 feet equal to a *sextans*. *Actus* is the length of one furrow, or so far as the plough goes before it turns, in length 120 feet. A scruple contains 100 square feet.

The Grecian Measures of *Length*.

												Engl. Yds.	Ft.	Inches.
Digit,												0.	0.	0,75581
4	Doron, Dochme,											0.	0.	3,02324
10	$2\frac{1}{2}$	Lichas,										0.	0.	7,5581
11	$2\frac{3}{4}$	$1\frac{1}{10}$	Orthodoron,									0.	0.	8,31392
12	3	$1\frac{1}{3}$	$1\frac{1}{11}$	Spithame,								0.	0.	9,06973
16	4	$1\frac{3}{10}$	$1\frac{5}{11}$	$1\frac{1}{3}$	Foot,							0.	1.	0,09297
18	$4\frac{1}{2}$	$1\frac{4}{5}$	$1\frac{7}{11}$	$1\frac{1}{2}$	$1\frac{1}{8}$	Cubit,						0.	1.	1,60459
20	5	2	$1\frac{9}{11}$	$1\frac{2}{3}$	$1\frac{7}{10}$	$1\frac{1}{9}$	Pygon,					0.	1.	3,11621
24	6	$2\frac{2}{5}$	$2\frac{2}{11}$	2	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	Cubit larger,				0.	1.	6,13945
96	24	$9\frac{3}{5}$	$8\frac{8}{11}$	8	6	$5\frac{1}{3}$	$4\frac{4}{9}$	4	Pace,			2.	0.	0,5578
9600	2400	960	$872\frac{8}{11}$	800	600	$533\frac{1}{3}$	480	400	100	Stadium,		201.	1.	7,78
76800	19200	7680	$6981\frac{9}{11}$	6400	4800	$4266\frac{2}{3}$	3840	3200	800	8	Mile,	161[illegible].	1.	2,24

475. The stadium contained 125 geometrical paces, or 625 *Roman* feet, and answered to our furlong. There were however stadia of different lengths, according to different times and places. This has rendered many of the recorded Grecian measures subject to uncertainty. They had a stadium of 10 to the mile, equal to 161,0248 yards, and another, or Macedonian, equal to 115,9595 yards.

476. The Grecian *square* measure was the *plethron*, or acre, containing, according to some, 1444, or according to others, 10000 square feet; and the *aroura*, which was half the *plethron*. The *Ægyptian* aroura was the square of 100 cubits.

Scripture Measures of *Length*.

								Engl. Yds.	Ft.	Inches.
Digit,								0,	0.	0,912
4	Palm,							0.	0.	3,648
12	3	Span,						0.	0.	10,944
24	6	2	Cubit,					0.	1.	9,888
96	24	8	4	Fathom,				2.	1.	3,552
144	36	12	6	$1\frac{1}{2}$	Ezekiel's Rod,			3.	1.	11,328
192	48	16	8	2	$1\frac{1}{3}$	Arabian Pole,		4.	2.	7,104
1920	480	160	80	20	$13\frac{1}{3}$	10	Schænus, or Measuring Line,	48.	1	11,04

The longer Scripture Measures.

						Eng. Miles.	Yards.	Feet.
Cubit,						0.	0.	1,824
400	Stadium,					0.	243.	0,6
2000	5	Sabbath Day's Journey,				0.	1216.	0,
4000	10	2	Eastern Mile,			1.	672.	0,
12000	30	6	3	Parasang,		4.	256.	0,
96000	240	48	24	8	A Day's Journey,	33.	288.	0,

477. The East used another span equal to one third of a cubit.

478. The above are sacred measures, in the lengths of which there must necessarily be some degree of uncertainty. Arbuthnot makes the sacred cubit=1,7325 feet. He also observes, that the Jews sometimes made use of a profane cubit, the length of which he determined to be 1,485 feet.

The

The Length of Long Measures of Various Countries, in Terms of English Feet and Inches.

		Ft.	Inches.			Ft.	Inches.
Ancient Roman	Foot	0.	11,626	Rynland, or Leyden	Ell	2.	3,120
Greek	do.	1.	0,090	Frankfort	do.	1.	9,912
Arabic	do.	0.	10,544	Hamburgh	do.	1.	10,860
Alexandria	do.	1.	2,112	Leipsic	do.	2.	3,120
Paris	do.	1.	0,789	Lubeck	do.	1.	10,896
Rynland, or Leyden	do.	1.	0,361	Noremburg	do.	2.	2,724
Amsterdam	do.	0.	11,304	Bavaria	do.	0.	11,448
Antwerp	do.	0.	11,352	Vienna	do.	1.	0,636
Dort	do.	1.	2,208	Bononia	do.	2.	1,764
Bologne	do.	1.	2,974	Dantzic	do.	1.	10,836
Turin	do.	1.	8,222	Florence	Brace, or Ell	1.	10,956
Venice	do.	1.	1,677	Spanish	Palm	0.	9,012
Padua	do.	1.	4,866	Genoa	do.	0.	9,960
Vienna	do.	1.	0,444	Naples	do.	0.	10,316
Sweden	do.	1.	2,701	Modern Roman	do.	0.	8,798
Lorrain	do.	0.	11,496	Spanish	Vare	3.	0,040
Middleburg	do.	0.	11,892	Lisbon	do.	2.	9,000
Strasburg	do.	0.	11,040	Gibraltar	do.	2.	9,120
Bremen	do.	0.	11,568	Toledo	do.	2.	8,220
Cologn	do.	0.	11,448	Castile	do.	2.	8,949
Frankfort ad Mænum	do.	0.	11,376	Naples	Brace	2.	1,200
Spanish	do.	1.	0,012	Naples	Canna	6.	10,560
Toledo	do.	0.	10,788	Milan	Calamus	6.	6,528
Bononia	do.	1.	2,448	Florence	Braccio da Panna	1.	10,954
Mantua	do.	1.	6,838	Russia	Archine	2.	4,242
Dantzic	do.	0.	11,328	Rome	Palmodi Architetti	0.	8,784
Copenhagen	do.	0.	11,580	Parma	Cubit	1.	10,392
Riga	do.	1.	9,972	China	do.	1.	0,192
Prague	do.	1.	0,312	Cairo	do.	1.	9,888
Lyons	Ell	3.	11,604	Old Babylonian	do.	1.	6,240
Bologna	do.	2.	0,912	Turkish	Pike larger	2.	2,400
Amsterdam	do.	2.	3,228	Turkish	Pike smaller	2.	1,572
Antwerp	do.	2.	3,276	Persian	Arish	3.	2,364

The Length of Miles, Leagues, &c. Ancient and Modern, in English Yards.

	Yards.
Ancient Roman mile	1610,348
Olympic stadium $= \frac{1}{8}$ of ancient Roman mile	201,2935
Stadium $= \frac{1}{10}$ of ancient Roman mile	161,0348
Stadium = to the 1100th part of a degree	111,2
Jewish risin, of which $7\frac{1}{2}$ = ancient Roman mile	214,713
Gallic leuca $= 1\frac{1}{2}$ ancient Roman mile	2415,522
German rast, or common league in France, = 2 Gallic leuca	4831,044
Persian parasang = 2 Gallic leagues	4831,044
Ægyptian schæne = 4 ancient Roman miles	6441,392
German league, or that of Scandinavia, = 2 rasts	9662,088
The mile or league of Germany = 200 Rhenish yards	8239,846
Great Arabian mile, used in Palestine in the time of the Crusades, rated at $1\frac{1}{2}$ ancient Roman mile	2415,713
Modern Roman mile	1628,466
Modern Greek mile of 7 olympic stadia	1409,0545
Modern French league = 2500 toises	5328,75
Mile of Turkey, and the common werst of Russia, supposing it 7 olympic stadia	1409,0545
League of Spain = 4 ancient Roman miles	6441,392
Large league of Spain = 5 ditto	8051,74

The mile employed by the Romans in Great Britain, and restored by Henry VII. was our present English mile.

The ancient Roman mile is here estimated at 755 French fathom, 3 feet, upon the authority of d'Anville. This differs a little from the mile used in the preceding table.

The present French Measures.

479. The measure of length is the *metre*; the measure of capacity is the *litre*; the measure of weight is the *gramme*; and the Agrarian measure is the *are*

480. A *metre* is the 40 millionth part of a meridian of the earth, which, according to the last French measurement, is 39,3702 English inches; and this is the unity of length. A decimetre is $\frac{1}{10}$ of a metre; a centimetre is $\frac{1}{100}$ of a metre; a millimetre is $\frac{1}{1000}$ of a metre, &c. and a decametre is 10 metres; an hectometre is 100 metres; a kilometre is 1000 metres, &c. Thus all the multiples and submultiples are taken in a tenfold proportion; and the same for the other measures.

481. A *litre* is a cube whose side is $\frac{1}{10}$ of a metre; it contains therefore 61,0242 cubic inches; and this is the unity of solidity. A decilitre is $\frac{1}{10}$ of a litre; a centilitre is $\frac{1}{100}$ of a litre; a millilitre is $\frac{1}{1000}$ of a litre, &c. And a decalitre is 10 litres; an hectolitre is 100 litres; a kilolitre is 1000 litres, &c.

482. A *gramme* is the weight of a cube of distilled water, the side of which is $\frac{1}{100}$ of a metre; it weighs therefore 15,45 ounces troy; and this is the unity of weight. A decigramme is $\frac{1}{10}$ of a gramme; a centigramme is $\frac{1}{100}$ of a gramme; a milligramme is $\frac{1}{1000}$ of a gramme, &c. And a decagramme is 10 grammes; an hectogramme is 100 grammes; a kilogramme is 1000 grammes, &c.

483. An *are* is the square of the decametre, or 100 square metres; and this is the unity. A deciare is $\frac{1}{10}$ an are; a centiare is $\frac{1}{100}$ of an are; a milliare is $\frac{1}{1000}$ of an are, &c. And a deca are, or decare, is 10 ares; an hectare is 100 ares; a kilare is 1000 ares, &c.

On the Logline.

484. A log is a piece of board in the form of the quadrant of a circle, having its circular side loaded with weights to make it swim upright. To this log is fastened a line of about 150 fathoms, called the log line; this is divided into equal spaces, called knots, each of which ought to bear the same proportion to a nautical mile, as $\frac{1}{2}$ a minute bears to an hour. They are called knots, because at the end of each of them there is fixed a piece of twine with knots in it; and these are subdivided into tenths. Now a nautical mile=6120 feet, and the $\frac{1}{120}$ part=51 feet; now $\frac{1}{2}'$: 1 hour :: 51 feet: 6120 feet, or a mile; therefore if 51 feet of the logline run off in $\frac{1}{2}'$, 1 mile will be run off in an hour; hence, as many knots as are run off in an hour, so many miles the ship sails in an hour. But as the ship's run is found to be rather more than that given by the log, owing to the log being drawn forward, they generally allow only 50 feet for a knot; and some commanders allow less. And to measure the time, they have a sand glass which runs out in half a minute.

485. The line runs off a reel which turns very easily; and the log is thrown from the poop, or lee quarter; and they generally let it run 12 or 15 fathom, so as to be out of the ship's wake, and then begin to count. There is commonly fastened a piece of red rag, to show where you are to begin to reckon. Care must be taken to have the hour glass and log line correct, otherwise an allowance must be made.

486. If the log line and the time of the running out of the glass be both altered in the same proportion, the number of knots run out in 1 glass will still show the number of miles run in an hour; for if the knots be 40 ft. and the glass run out in 24", then 24" : 30" :: 40 ft :: 50 ft. so that 50 feet is still run out in half a minute.

487. In King's ships, Indian ships, and some others, the log is hove every hour; but in coasters, and those using short voyages, every two hours.

A TABLE

A

TABLE

OF THE

LATITUDES and LONGITUDES

OF THE

PRINCIPAL PLACES ON THE EARTH'S SURFACE.

A.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Abbeville	Eur.	France	50 7 4 N	1 49 43 E	0 7 19 E	
Abo	Eur.	Finland	60 27 10 N	22 13 30 E	1 28 54 E	
Achem	Asia	Sumatra	5 22 0 N	95 34 0 E	6 22 16 E	
Adventure (Bay)	Asia	New Holland	43 23 0 S	147 30 0 E	9 50 0 E	
Adventure (Isle)	Asia	Pacific Ocean	17 5 15 S	144 17 45 W	9 37 11 W	
Agde	Eur.	France	43 18 43 N	3 27 55 E	0 13 52 E	
Agen	Eur.	France	44 12 22 N	0 36 20 E	0 2 25 E	
St. Agnes (Lights)	Eur.	Scillies	49 56 0 N	6 46 0 W	0 27 4 W	
Agra	Asia	India	26 43 0 N	76 44 0 E	5 6 56 E	
Aire	Eur.	France	43 41 52 N	4 55 51 E	0 19 43 E	
Aix	Eur.	France	43 31 48 N	5 26 32 E	0 21 46 E	
Alby	Eur.	France	43 55 36 N	2 8 18 E	0 8 33 E	
Aleppo	Asia	Turkey	35 11 25 N	37 10 0 E	2 28 40 E	
Alexandretta	Asia	Syria	36 35 27 N	36 15 0 E	2 25 0 E	
Alexandria	Africa	Egypt	31 11 28 N	30 10 22 E	2 0 41 E	
Algiers	Africa	Algiers	36 49 30 N	2 12 45 E	0 8 51 E	
Amboise	Eur.	France	47 24 54 N	0 59 7 W	0 3 56 W	
Ambrym (Isle)	Asia	Pacific Ocean	16 9 30 S	168 12 30 E	11 12 50 E	
Amiens	Eur.	France	49 53 43 N	2 17 56 E	0 9 12 E	
Amsterdam	Eur.	Holland	52 21 56 N	4 51 30 E	0 19 26 E	3 0
Amsterdam (Isle)	Asia	Pacific Ocean	21 9 0 S	174 46 0 W	11 39 4 W	8 30
Ancona	Eur.	Italy	43 37 54 N	13 28 52 E	0 53 56 E	
Angers	Eur.	France	47 28 9 N	0 33 15 W	0 2 13 W	
Angoulême	Eur.	France	45 38 57 N	0 9 15 E	0 0 26 E	

The

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Angra	Eur.	Tercera	38 39 0 N	27 12 15 W	1 48 49 W	
Annamocka	Asia	Pacific Ocean	20 16 30 S	174 30 30 W	11 38 2 W	
St. Anthony's (Cape)	Amer.	Staten Land	54 46 45 S			
Antibes	Eur.	France	43 34 43 N	7 7 20 E	0 28 29 E	
Antigua (St. John's)	Amer.	Carib. Sea	17 4 30 N	62 9 0 W	4 8 36 W	
Antwerp	Eur.	Flanders	51 13 15 N	4 22 45 E	0 17 31 E	6 0
Anvers	Eur.	Netherlands	51 13 15 N	4 24 15 E	0 17 37 E	
Apæ (Isle)	Asia	Pacific Ocean	16 46 15 S	168 27 30 E	11 13 50 E	
Aracta	Asia	Turkey	36 1 0 N	38 50 0 E	2 35 20 E	
Archangel	Eur.	Russia	64 33 36 N	38 59 15 E	2 35 57 E	6 0
Arica	Amer.	Peru	18 26 38 S	70 25 0 W	4 41 40 W	
Arles	Eur.	France	43 40 28 N	4 37 24 E	0 18 30 E	
Arras	Eur.	France	50 17 30 N	2 46 12 E	0 11 5 E	
Ascension (Isle)	Africa	S. Atl. Ocean	7 57 0 S	13 59 0 W	0 55 56 W	
Athens	Eur.	Turkey	38 5 0 N	23 52 30 E	1 35 30 E	
Auch	Eur.	France	43 38 39 N	0 34 56 E	0 2 18 E	
St. Augustin	Africa	Madagascar	23 35 29 S	43 8 0 E	2 52 32 E	
Aurillac	Eur.	France	44 55 10 N	2 27 0 W	0 9 48 W	
Aurora (Isle)	Asia	Pacific Ocean	15 8 0 S	168 17 0 E	11 13 8 E	
Autun	Eur.	France	46 56 48 N	4 17 44 E	0 17 11 E	
Auxerre	Eur.	France	47 47 57 N	3 34 6 E	0 14 16 E	
Auxonne	Eur.	France	47 11 24 N	5 23 35 E	0 21 34 E	
Avignon	Eur.	France	43 56 58 N	4 48 10 E	0 19 13 E	
Avranches	Eur.	France	48 41 21 N	1 21 51 W	0 5 27 W	
B.						
Babelmondel Straits	Africa	Abyssinia	12 50 0 N	43 50 0 E	2 55 20 E	
Babylon (Ancient)	Asia	Mesopotamia	33 0 0 N	42 46 30 E	2 51 6 E	
Bagdad	Asia	Mesopotamia	33 19 40 N	44 24 30 E	2 57 38 E	
Balasore	Asia	India	21 20 0 N	86 0 0 E	5 44 0 E	
Ballabea (Isle)	Asia	N. Caledonia	20 7 0 S	164 22 0 E	10 57 28 E	
Banguey (Peak)	Asia	Malacca	7 18 0 N	117 17 30 E	7 49 10 E	
Bantrey Bay	Eur.	Ireland	51 36 0 N	10 10 0 W	0 40 40 W	
Barbadoes, Bridge Town	Amer.	Atl. Ocean	13 0 0 N	59 50 0 W	3 59 20 W	
Barbas (Cape)	Africa	Sanhaga	22 15 30 N	16 40 0 W	1 6 40 W	
Barbuda (Isle)	Amer.	Atl. Ocean	17 49 45 N	61 50 0 W	4 7 20 W	
Barcelona	Eur.	Spain	41 23 0 N	2 13 0 E	0 8 52 E	
Barnevelt's (Isle)	Amer.	Terra del Fuego	55 49 0 S	66 58 0 W	4 27 52 W	
St. Bartholomew's (Isle)	Asia	N. Hebrides	15 42 0 S	167 17 30 E	11 9 10 E	
Basil	Eur.	Switzerland	47 35 0 N	7 29 30 E	0 29 58 E	
Basse Terre	Amer.	Gaudaloupe	15 59 30 N	61 59 15 W	4 7 57 W	
Batavia	Asia	Java	6 12 0 S	106 53 46 E	7 7 35 E	
Bath	Eur.	England	51 22 30 N	2 21 30 W	0 9 26 W	
Baycux	Eur.	France	49 16 34 N	0 42 11 W	0 2 49 W	
Bayonne	Eur.	France	43 29 15 N	1 28 41 W	0 5 55 W	3 30
Beachey Head	Eur.	England	50 44 30 N	0 19 40 E	0 1 19 E	0 0

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Bear (Isle)	Amer.	Hudson's Bay	54 34 0 N	79 56 0 W	5 19 44 W	12 0
Beauvois	Eur.	France	49 26 0 N	2 4 42 E	0 8 19 E	
Belle Isle	Eur.	France	47 17 17 N	3 5 0 W	0 12 20 W	2 30
Bembridge Point	Eur.	Isle of Wight	50 40 15 N	1 4 45 W	0 4 19 W	
Bencoolen	Asia	Sumatra	3 49 16 S	102 10 30 E	[illegible] E	
Berlin	Eur.	Germany	52 31 30 N	13 22 0 E	[illegible] 28 E	
Bermudas (Isle)	Amer.	Atl. Ocean	32 35 0 N	63 28 0 W	[illegible] 52 W	7 0
Besanson	Eur.	France	47 14 12 N	6 2 46 E	0 24 11 E	
Besiers	Eur.	France	43 20 23 N	3 12 24 E	0 12 50 E	
Blanco (Cape)	Africa	Negroland	20 55 50 N	17 10 0 W	1 8 40 W	9 45
Blanco (Cape)	Amer.	Patagonia	47 20 0 S	64 42 0 W	4 18 48 W	
Blois	Eur.	France	47 35 20 N	1 20 10 E	0 5 20 E	
Bojador (Cape)	Africa	Negroland	26 12 30 N	14 27 0 W	0 57 48 W	0 0
Bolabola (Isle)	Asia	Pacif. Ocean	16 32 30 S	151 52 0 W	10 7 28 W	
Bologne	Eur.	France	50 43 33 N	1 36 33 E	0 6 26 E	10 30
Bologna	Eur.	Italy	44 29 36 N	11 21 15 E	0 45 25 E	
Bolschereskoi	Asia	Siberia	52 54 30 N	156 37 30 E	10 26 30 E	
Bombay	Asia	India	18 56 40 N	72 38 0 E	4 50 32 E	
Bonavista (Isle)	Africa	Atl. Ocean	16 6 0 N	22 47 15 W	1 31 9 W	
Boston	Amer.	New England	42 22 11 N	70 59 0 W	4 43 56 W	
Botany Bay	Asia	New Holland	34 0 0 S	151 21 0 E	10 5 24 E	
Botany (Island)	Asia	New Caledonia	22 26 40 S	167 16 45 E	11 9 7 E	
Bourbon (Isle)	Africa	Ind. Ocean	20 51 43 S	55 30 0 E	3 42 0 E	
Bourdeaux	Eur.	France	44 50 14 N	0 34 14 W	0 2 17 W	3 0
Bourges	Eur.	France	47 4 59 N	2 23 45 E	0 9 35 E	
Breslaw	Eur.	Silesia	51 3 0 N	17 8 45 E	1 8 35 E	
Brest	Eur.	France	48 22 42 N	4 29 19 W	0 17 57 W	3 45
Bridge Town	Amer.	Barbadoes	13 5 0 N	58 35 0 W	3 54 20 W	
St. Brieux	Eur.	France	48 31 21 N	2 43 17 W	0 10 53 W	
Brighton Starting-house	Eur.	England	50 49 48 N	0 6 28 W	0 0 26 W	
Bristol (Cape)	Amer.	Sandwich Land	59 2 30 S	26 51 0 W	1 47 24 W	
Brussels	Eur.	Brabant	50 50 59 N	4 21 15 E	0 17 25 E	
Buenos Ayres	Amer.	Brasil	34 35 26 S	58 31 15 W	3 54 5 W	
Bukarost	Eur.	Walachia	44 26 45 N	26 8 0 E	1 44 32 E	
Buller (Cape)	Amer.	S. Georgia	53 58 30 S	37 40 0 W	2 30 40 W	
Burgeo (Isles)	Amer.	Newfoundland	47 36 20 N	57 36 30 W	3 50 24 W	
Burlings	Eur.	Portugal	39 20 0 N	9 36 45 W	0 38 27 W	
C.						
Cabello (Port)	Amer.	Terra Firma	10 30 50 N	67 32 0 W	4 30 8 W	
Cadiz	Eur.	Spain	36 32 0 N	6 16 15 W	0 25 5 W	4 30
Caen	Eur.	France	49 11 12 N	0 21 53 W	0 1 28 W	9 0
Cahors	Eur.	France	44 26 49 N	1 26 22 E	0 5 45 E	
Cairo	Africa	Egypt	30 3 12 N	31 18 16 E	2 5 49 E	
Calais	Eur.	France	50 57 32 N	1 51 1 E	0 7 24 E	11 30
Callao	Amer.	Peru	12 1 53 S	76 58 0 W	5 7 52 W	
Calcutta (F. Will.)	Asia	India	22 34 45 N	88 29 30 E	5 53 58 E	

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Calmar	Eur.	Sweden	56 40 30 N	16 21 45 E	1 5 27 E	
Cambray	Eur.	France	50 10 37 N	3 13 32 E	0 12 54 E	
Cambridge	Eur.	England	52 12 35 N	0 4 15 E	0 0 17 E	
Cambridge	Amer.	N. England	42 23 28 N	71 4 0 W	4 44 16 W	
Canary (Isle) N. E. Point	Africa	Canaries	28 13 0 N	15 38 45 W	1 2 35 W	3 0
Candia (Isle)	Eur.	Medit. Sea	35 18 35 N	25 18 0 E	1 41 12 E	
Candlemas Isles	Amer.	Sandwich Lan.	57 10 0 S	27 13 0 W	1 48 52 W	
Canso (Port)	Amer.	Nova Scotia	45 20 7 N	60 55 0 W	4 3 40 W	
Canterbury Cathedral	Eur.	England	51 18 26 N	1 4 53 E	0 4 19 E	
Canton	Asia	China	23 8 9 N	113 2 30 E	7 33 10 E	
Cape Capricorn	Asia	N. Holland	23 26 40 S	208 54 20 W	13 55 57 W	
Cape Clear	Eur.	Ireland	51 15 0 N	9 50 0 W	0 39 20 W	4 30
Cape Colenet	Asia	N. Caledonia	20 30 0 S	164 56 0 E	10 59 44 E	
Cape Comerin	Asia	India	7 56 0 N	78 5 0 E	5 22 20 E	
Cape Coronation	Asia	N. Caledonia	22 5 0 S	167 8 0 E	11 8 32 E	
Cape Cumberland	Asia	N. Hebrides	14 39 30 S	166 47 0 E	11 7 8 E	
Cape Florida	Am.	Florida	25 44 0 N	80 44 0 W	5 22 56 W	
Cape How	Asia	N. Holland	57 31 57 S	210 39 3 W	14 2 36 W	
Cape Table	Asia	New Zealand	39 6 40 S	181 57 41 W	12 7 51 W	
Carlescroon	Eur.	Sweden	56 6 57 N	15 26 15 E	1 1 45 E	
Carthagena	Eur.	Spain	37 37 0 N	1 8 30 W	0 4 34 W	
Carthagena	Amer.	Terra Firma	10 25 19 N	75 42 54 W	5 2 52 W	
Casan	Asia	Siberia	55 43 58 N	49 8 15 E	3 16 33 E	
Cassel	Eur.	Germany	51 19 20 N	9 35 3 E	0 38 20 E	
Castres	Eur.	France	43 36 11 N	2 14 16 E	0 8 57 E	
St. Catherine's (Isle)	Am.	Atl. Ocean	27 35 0 S	49 17 0 W	3 17 30 W	
Cavan	Eur.	Ireland	54 51 41 N	7 23 0 W	0 29 32 W	
Cayenne	Amer.	Isle Cayenne	4 56 15 N	52 15 0 W	3 29 0 W	
Ceylon, S. Point	Asia	India	5 47 0 N	81 2 0 E	5 24 8 E	
Cette	Eur.	France	43 23 51 N	3 42 7 E	0 14 48 E	
Challon	Eur.	France	46 46 54 N	4 51 27 E	0 19 24 E	
Châlons	Eur.	France	48 57 28 N	4 21 29 E	0 17 26 E	
Chandernagor	Asia	India	22 51 26 N	88 29 15 E	5 53 27 E	
Q. Charlotte Sound	Asia	N. Zealand	41 5 58 S	174 13 32 E	11 36 54 E	9 0
Q. Charl. Foreland	Asia	N. Caledonia	22 15 0 S	167 12 45 E	11 8 51 E	
Q. Charlotte's Cape	Am.	South Georgia	54 32 0 S	36 11 30 W	2 24 46 W	
Charlton Isle	Am.	Hudson's Bay	52 3 0 N	79 5 0 W	5 16 20 W	
Chartres	Eur.	France	48 26 54 N	1 29 35 E	0 5 56 E	
Cherbourg	Eur.	France	49 38 31 N	1 37 18 W	0 6 29 W	7 30
Christmas Sound	Am.	Terra del Fuego	55 21 57 S	70 2 50 W	4 40 11 W	2 30
St. Christopher's (Isle)	Am.	Carib. Sea	17 15 0 N	62 43 0 W	4 10 52 W	
Churchill River	Am.	Hudson's Bay	58 47 32 N	94 7 30 W	6 16 30 W	7 20
Civita Vecchia	Eur.	Italy	42 5 24 N	15 46 15 E	0 47 5 E	
Clerke's Isles	Am.	Atl. Ocean	55 5 30 S	34 42 0 W	2 18 48 W	
Clermont	Eur.	France	45 46 44 N	3 5 2 E	0 12 20 E	
Cochin	Asia	India	9 33 0 N	75 35 0 E	5 2 20 E	

The

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Colmar	Eur.	France	48 4 44 N	7 22 11 E	0 29 29 E	
Cologne	Eur.	Germany	50 55 21 N	6 55 0 E	0 27 40 E	
Compiegne	Eur.	France	49 24 59 N	2 49 41 E	0 11 10 E	
Conception	Am.	Chili	36 42 53 S	72 40 0 W	4 50 40 W	
Conſtantinople	Eur.	Turkey	41 1 27 N	28 55 0 E	1 55 40 E	
Cooper's Iſle	Am.	Atl. Ocean	54 57 0 S	36 4 20 W	2 24 17 W	
Copenhagen	Eur.	Denmark	55 41 4 N	12 35 15 E	0 50 21 E	
Coquimbo	Am.	Chili	29 52 0 S	71 19 0 W	4 45 3 W	
Cork	Eur.	Ireland	51 53 54 N	8 28 15 W	0 33 53 W	6 30
Corvo	Eur.	Azores	39 42 0 N	31 6 0 W	2 4 24 W	
Countancea	Eur.	France	49 2 50 N	1 27 25 W	0 5 50 W	
Cowes Weſt, Fort	Eur.	Iſle of Wight	50 46 18 N	1 17 17 W	0 5 9 W	10 30
Cracow	Eur.	Poland	49 59 20 N	19 50 0 E	1 19 20 E	
Cremſmunſter	Eur.	Germany	48 3 29 N	14 7 0 E	0 56 28 E	
Croiſic	Eur.	France	47 17 40 N	2 31 42 W	0 10 7 W	
Cummin (Iſle)	Aſia	Pacific Ocean	31 40 0 N	121 4 0 E	8 4 16 E	
Cyprus	Aſia	Syria	34 30 0 N	33 16 0 E	2 13 4 E	
D.						
Dantzic	Eur.	Poland	54 21 9 N	18 38 0 E	1 14 32 E	
Dardenels Straits	Eur.	Turkey	40 10 0 N	26 26 0 E	1 45 44 E	
Daſſen Iſland	Africa	Caffers	33 25 0 S	18 2 0 E	1 12 8 E	
Dax	Eur.	France	43 42 19 N	1 3 16 W	0 4 13 W	
Deal Caſtle	Eur.	England	51 13 5 N	1 23 59 E	0 5 36 E	
St. Dennis	Africa	I. Bourbon	20 51 43 S	55 30 0 E	3 42 0 E	
Diego (Cape)	Am.	Terra del Fuego	54 33 0 S	65 14 0 W	4 20 56 W	
Dieppe	Eur.	France	49 55 34 N	1 4 29 E	0 4 18 E	10 30
Dijon	Eur.	France	47 19 25 N	5 1 50 E	0 20 7 E	
Dillingen	Eur.	Germany	48 34 22 N	10 14 30 E	0 40 58 E	
Diſappointm. (Cape)	Am.	So. Georgia	54 58 0 S	36 15 0 W	2 25 0 W	
Diſſeada (Cape)	Am.	Terra del Fuego	55 4 15 S	74 18 0 W	4 57 12 W	
Dol	Eur.	France	48 33 8 N	1 45 18 W	0 7 2 W	
Domingo, Mole,	Aſia	Atl. Ocean	19 49 0 N	73 25 0 W	4 53 40 W	
Dominique (Iſle)	Am.	Windward Iſles	15 18 23 N	61 27 55 W	4 5 52 W	
Dorcheſter Church	Eur.	England	50 42 58 N	2 25 40 W	0 9 43 W	
Douay	Eur.	Flanders	50 22 12 N	3 4 47 E	0 12 19 E	
Dover	Eur.	England	51 7 47 N	1 18 30 E	0 5 14 E	11 30
Dreux	Eur.	France	48 44 17 N	1 21 24 E	0 5 26 E	
Dronthiem	Eur.	Norway	63 26 2 N	10 22 0 E	0 41 28 E	
Dublin	Eur.	Ireland	53 21 11 N	6 6 30 W	0 24 26 W	9 15
Dungeneſs	Eur.	England	50 52 20 N	0 59 6 E	0 3 56 E	9 45
Dunkirk	Eur.	France	51 2 11 N	2 22 23 E	0 9 30 E	0 0
Durham	Eur.	England	54 43 45 N	1 15 0 W	0 5 0 W	
Duſkey Bay	Aſia	N. Zealand	45 47 27 S	166 18 9 E	11 5 13 E	10 57
Dunnuſe	Eur.	England	50 33 30 N	1 16 20 W	0 5 5 W	9 45

The

The Latitudes and Longitudes of Places.

E.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Eaoowe (Isle)	Asia	Pacific Ocean	21 24 0 S	174 30 0 W	11 38 0 W	2 0
Easter Island	Am.	Pacific Ocean	27 6 30 S	109 46 45 W	7 19 7 W	4 30
Edinburgh	Eur.	Scotland	55 57 57 N	3 12 15 W	0 12 49 W	5 30
Edystone	Eur.	Eng. Channel	50 8 0 N	4 24 0 W	0 17 24 W	
Elsinore	Eur.	Denmark	56 0 0 N	13 35 0 E	0 54 20 E	
Embden	Eur.	Germany	53 5 0 N	7 26 0 E	0 29 44 E	
Embrun	Eur.	France	44 34 0 N	6 29 0 E	0 25 56 E	
Enatum (Isle)	Asia	Pacific Ocean	20 10 0 S	170 4 0 E	11 20 16 E	
Endeavour River	Asia	N. Holland	15 27 11 S	214 50 0 W	14 19 20 W	
English Road	Asia	Eaoowe	21 20 30 S	174 34 0 W	11 38 16 W	
Erramanga (Isle)	Asia	Pacific Ocean	18 46 30 S	169 18 30 E	11 17 14 E	
Erzerum	Asia	Armenia	39 56 35 N	48 35 45 E	3 14 23 E	
Eustachia (Town)	Am.	Carib. Sea	17 29 0 N	63 10 0 W	4 12 40 W	
Evout's Isles	Am.	Terra del Fuego	55 34 30 S	66 39 0 W	4 27 56 W	
Evereux	Eur.	France	49 1 30 N	1 8 54 E	0 4 35 E	
Exeter	Eur.	England	50 44 0 N	3 34 30 W	0 14 36 W	

F.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
Falmouth	Eur.	England	50 8 0 N	5 2 30 W	0 20 10 W	5 30
False (Cape)	Afric.	Caffres	34 16 0 S	18 44 0 E	1 14 56 E	
False Bay	Afric.	Caffres	34 10 0 S	18 33 0 E	1 14 12 E	
Farewell (Cape)	Am.	Greenland	59 38 0 N	42 42 0 W	2 50 48 W	
Farewell (Cape)	Asia	N. Zealand	40 37 0 S	172 41 30 E	11 30 46 E	
Fayal Town	Eur.	Azores	38 32 20 N	28 41 5 W	1 54 44 W	2 20
Ferdinand Noronha	Am.	Brazil	3 56 20 S	32 38 0 W	2 10 32 W	
Ferrara	Eur.	Italy	44 49 56 N	11 36 10 E	0 46 25 E	
Ferro Isle (Town)	Afric.	Canaries	27 47 20 N	17 45 50 W	1 11 3 W	
Finisterre (Cape)	Eur.	Spain	42 54 0 N	9 17 10 W	0 37 9 W	
Flamborough Head	Eur.	England	54 8 0 N	0 11 0 E	0 0 44 E	
Florence	Eur.	Italy	43 46 30 N	11 3 30 E	0 44 14 E	
Flores	Eur.	Azores	39 34 0 N	31 0 0 W	2 4 0 W	
St. Flour	Eur.	France	45 1 55 N	3 5 30 E	0 12 22 E	
Fortaventure (W. Pt.)	Afric.	Canaries	28 4 0 N	14 31 30 W	0 58 6 W	
Foul Point	Afric.	Madagascar	17 40 14 S	49 53 0 E	3 19 32 E	
France (Isle of)	Afric.	Indian Ocean	20 9 45 S	57 28 0 E	3 49 52 E	
Francfort (on the Ma.)	Eur.	Germany	49 55 0 N	8 35 0 E	0 34 20 E	
François (Cape)	Am.	Hispaniola	19 46 30 N	72 18 0 W	4 49 12 W	
Old Cape François	Am.	Hispaniola	19 40 30 N	70 2 0 W	4 40 8 W	
Frawenburgh	Eur.	Prussia	54 22 15 N	20 7 30 E	1 20 30 E	
Freius	Eur.	France	43 25 52 N	6 43 54 E	0 26 56 E	
Frekel (Cape)	Eur.	France	48 41 3 N	6 0 0 W	0 24 0 W	
Friesland's Peak	Am.	Sandw. Land	59 2 0 S	26 55 30 W	1 47 42 W	

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Fronſac (Strait)	Am.	Nova Scotia	45 36 57 N	61 19 30 W	4 5 18 W	
Fuego (Iſle)	Africa	Cape Verd	14 56 45 N	24 28 0 W	1 37 52 W	
Funchal	Africa	Madeira	32 37 40 N	17 6 15 W	1 8 25 W	12 4
Furneaux Iſland	Aſia	Pacif. Ocean	17 11 0 S	143 6 40 W	9 28 27 W	
G.						
Gap	Eur.	France	44 33 37 N	6 4 47 E	0 24 19 E	
Gabey	Aſia	New Guinea	0 6 0 S	126 23 45 E	8 25 35 E	
Genes	Eur.	Italy	44 25 0 N	8 35 45 E	0 34 23 E	
Geneva	Eur.	Savoy	46 12 0 N	6 0 0 E	0 24 0 E	
Genoa	Eur.	Italy	44 25 0 N	8 56 37 E	0 34 23 E	
St. George (Iſle)	Eur.	Azores	38 39 0 N	28 0 0 W	1 52 0 W	
St. George (Town)	Amer.	Bermudas	32 45 0 N	63 35 0 W	4 14 20 W	
St. George (Fort)	Aſia	India	13 4 54 N	80 28 45 E	5 21 55 E	
St. George (Cape)	Aſia	New Britain	4 53 30 S	153 8 45 E	10 12 35 E	
George (Cape)	Amer.	South Georgia	54 17 0 S	36 32 30 W	2 26 10 W	
Ghent	Eur.	Flanders	51 3 0 N	3 43 45 E	0 14 55 E	
Gibraltar	Eur.	Spain	36 6 30 N	5 22 0 W	0 21 28 W	0 0
Gilbert's Iſle	Amer.	Terra del Fuego	55 13 0 S	71 6 45 W	4 44 11 W	
Glaſgow	Eur.	Scotland	55 51 32 N	4 15 0 W	0 17 0 W	
Goa	Aſia	India	15 31 0 N	73 45 0 E	4 55 0 E	
Goat Iſle	Aſia	Indian Ocean	13 55 0 N	120 2 0 E	8 0 8 E	
Gomera (Iſle)	Africa	Canaries	28 5 40 N	17 8 0 W	1 8 32 W	
Good Hope (Cape)	Africa	Caffres	34 29 0 S	18 23 15 E	1 13 33 E	3 0
Good Hope (Town)	Africa	Caffres	33 55 42 S	18 23 15 E	1 13 33 E	2 30
Goree (Iſle)	Africa	Atl. Ocean	14 40 10 N	17 25 0 W	1 9 40 W	1 30
Gottenburgh	Eur.	Sweden	57 42 0 N	11 38 45 E	0 46 35 E	
Gottengen (Obſer.)	Eur.	Germany	51 31 54 N	9 53 0 E	0 39 32 E	
Granville	Eur.	France	48 50 16 N	1 36 15 W	0 6 25 W	7 0
Graſſe	Eur.	France	43 39 19 N	6 55 9 E	0 27 41 E	
Gratioſa	Eur.	Azores	39 2 0 N	27 58 0 W	1 51 52 W	
Gratz	Eur.	Germany	47 4 9 N	15 25 45 E	1 1 48 E	
Gravelines	Eur.	Flanders	50 59 4 N	2 7 32 E	0 8 30 E	0 0
Greenwich (Obſer.)	Eur.	England	51 28 40 N	0 0 0	0 0 0	
Grenoble	Eur.	France	45 11 42 N	5 43 34 E	0 22 54 E	
Gryphiſwald	Eur.	Germany	54 4 25 N	13 38 30 E	0 54 34 E	
Gaudaloupe	Amer.	Carib. Sea	15 59 30 N	61 48 15 W	4 7 13 W	
Guiaquil	Amer.	Peru	2 11 21 S	81 11 30 W	5 24 46 W	
Gurief	Aſia	Siberia	47 7 7 N	51 56 0 E	3 27 44 E	
Guernſey	Eur.	Brit. Channel	49 30 0 N	2 47 0 W	0 11 8 W	

The Latitudes and Longitudes of Places.

H.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Hague	Eur.	Netherlands	52 4 10 N	4 17 30 E	0 17 10 E	8 15
Hamburgh	Eur.	Netherlands	53 33 3 N	10 1 11 E	0 39 20 E	6 0
Hang-lip (Cape)	Africa	Caffres	34 16 0 S	18 44 0 E	1 14 56 E	
Hanover	Eur.	Germany	52 22 18 N	9 48 15 E	0 38 57 E	
Harborough (Mark.)	Eur.	England	52 28 30 N	0 57 25 W	0 3 50 W	
Harlem	Eur.	Netherlands	52 22 14 N	4 37 0 E	0 18 28 E	
Haſtings	Eur.	England	50 52 10 N	0 41 10 E	0 2 45 W	
Havannah	Am.	Cuba	23 11 52 N	82 18 30 W	5 29 14 W	
Havre-de-grace	Eur.	France	49 29 14 N	0 6 23 E	0 0 26 E	9 0
Heeſe (La)	Eur.	Netherlands	51 23 2 N	4 45 30 E	0 10 2 E	
St. Helena (Ja. Town)	Africa	S. Atl. Ocean	15 55 0 S	5 49 0 W	0 23 16 W	
Henlopen (Cape)	Amer.	Virginia	38 46 0 N	75 12 30 W	5 0 50 W	
Hernoſand	Eur.	Sweden	62 38 0 N	17 53 0 E	1 11 32 E	
Hervey's Iſle	Aſia	Pacific Ocean	19 17 0 S	158 48 0 W	10 35 12 W	
Hinchinbroke Iſle	Aſia	Pacific Ocean	17 25 0 S	168 38 0 E	11 14 32 E	
Hoai Nghan	Aſia	China	33 34 40 N	118 49 30 E	7 55 18 E	
Hogue (Cape La)	Eur.	France	49 44 40 N	1 56 50 W	0 7 47 W	
Holyhead	Eur.	Wales	53 23 0 N	4 40 0 W	0 18 40 W	
Hood's Iſle	Aſia	Pacific Ocean	9 26 0 S	138 52 0 W	9 15 28 W	
Hoogſtraeten	Eur.	Netherlands	51 24 44 N	4 47 0 E	0 19 8 E	
Horn (Cape)	Am.	Terra del Fuego	55 58 0 S	68 13 0 W	4 29 44 W	
Hout Bay	Africa	Caffres	34 3 0 S	18 19 0 E	1 13 16 E	
Howe's Iſle	Aſia	Pacific Ocean	16 46 30 S	154 6 40 W	10 16 27 W	
Huahine (Iſle)	Aſia	Pacific Ocean	16 44 0 S	151 6 0 W	10 4 24 W	
Hull	Eur.	England	53 50 0 N	0 28 0 W	0 1 52 W	
Hurſt Caſtle	Eur.	England	50 42 23 N	1 32 45 W	0 6 11 W	

I. J.

Jaffa	Aſia	Syria	32 5 0 N	35 10 0 E	2 20 40 E	
Jamaica (Port-royal)	Am.	Atl. Ocean	18 0 0 N	76 44 30 W	5 6 58 W	
Jakutſkoi	Aſia	Siberia	62 1 30 N	129 47 45 E	8 39 11 E	
Janeiro (Rio)	Am.	Brazil	22 54 10 S	42 43 45 W	2 50 55 W	
Jaſſy	Eur.	Moldavia	47 8 30 N	27 29 45 E	1 49 59 E	
Java Head	Aſia	Java	6 49 0 S	106 50 0 E	7 7 20 E	
Jeruſalem	Aſia	Paleſtine	31 46 34 N	35 20 0 E	2 21 20 E	
St. Ildefonſo's Iſles	Am.	Terra del Fuego	55 51 0 S	69 21 0 W	4 37 52 W	
Immer (Iſle)	Aſia	Pacific Ocean	19 16 0 S	169 46 0 E	11 19 4 E	
Ingolſtadt	Eur.	Germany	48 45 45 N	11 22 30 E	0 45 30 E	
St. John's	Am.	Antigua	17 4 30 N	62 9 0 W	4 8 36 W	
St. John's	Am.	Newfoundland	47 32 0 N	52 26 0 W	3 29 44 W	6 0
Joppa	Aſia	Syria	32 45 0 N	36 0 0 W	2 24 0 W	
St. Joſeph's	Am.	California	23 3 42 S	109 42 30 W	7 18 50 W	
Irraname (Iſle)	Aſia	Pacific Ocean	19 31 0 S	170 21 0 E	11 21 24 E	

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Iſlamabad	Aſia	India	22 20 0 N	91 45 0 E	6 7 0 E	
Iſle of Pines	Aſia	Pacific Ocean	22 38 0 S	167 38 0 E	11 10 32 E	
Iſpahan	Aſia	Perſia	32 25 0 N	52 50 0 E	3 31 20 E	
St. Juan (Cape)	Am.	Staten Land	54 47 10 S	63 47 0 W	4 15 8 W	
Judda	Aſia	Arabia	21 29 0 N	39 22 0 E	2 37 28 E	
St. Juliana (Port)	Am.	Patagonia	49 10 0 S	68 44 0 W	4 34 56 W	4 45
Jutlia	Aſia	India	14 18 0 N	100 50 0 E	6 43 20 E	
K.						
Kedgeree	Aſia	India	21 48 0 N	88 50 15 E	5 55 21 E	
Kiow	Eur.	Ukraine	50 27 0 N	30 27 30 E	2 1 50 E	
Kola	Eur.	Lapland	68 52 30 N	33 0 30 E	2 12 2 E	
L.						
Ladrone (Grand)	Aſia	Pacific Ocean	22 2 0 N	113 56 0 E	7 35 44 E	
Laguna	Africa	Teneriſſe	28 28 57 N	16 18 15 W	1 5 13 W	
Lancarota (E. Pt.)	Africa	Canaries	29 14 0 N	13 26 0 W	0 53 44 W	
Laſdau	Eur.	France	49 11 38 N	8 7 30 E	0 32 30 E	
Landſcroon	Eur.	Sweden	55 52 31 N	12 50 46 E	0 51 23 E	
Lands-End	Eur.	England	50 4 7 N	5 41 31 W	0 22 46 W	
Langres	Eur.	France	47 52 17 N	5 19 23 E	0 21 18 E	
Lauſanne	Eur.	Switzerland	46 31 5 N	6 45 15 E	0 27 1 E	
Lectoure	Eur.	France	43 56 2 N	0 36 53 E	0 2 28 E	
Leeds	Eur.	England	53 48 0 N	1 34 15 W	0 6 17 W	
Leghorn	Eur.	Italy	43 33 0 N	10 25 0 E	0 41 40 E	
Leiceſter	Eur.	England	52 38 0 N	1 8 30 W	0 4 34 W	
Leipſic	Eur.	Saxony	51 19 14 N	12 20 0 E	0 49 20 E	
Leper's Iſland.	Aſia	Pacific Ocean	15 23 30 S	167 58 15 E	11 11 53 E	
Leſkeard	Eur.	England	50 26 55 N	4 41 45 W	0 18 47 W	
Leſparre	Eur.	France	45 18 33 N	0 57 3 W	0 3 48 W	
Leyden	Eur.	Holland	52 8 40 N	4 28 0 E	0 17 52 E	
Liege	Eur.	Netherlands	50 37 30 N	5 35 0 E	0 22 20 E	
Lima	Am.	Peru	12 1 15 S	76 49 30 W	5 7 18 W	
Limoges	Eur.	France	45 49 44 N	1 15 50 E	0 5 4 E	
Lintz	Eur.	Germany	48 16 0 N	13 57 30 E	0 55 50 E	
Liſieux.	Eur.	France	49 8 50 N	0 13 32 E	0 0 54 E	
Liſle	Eur.	Flanders	50 37 50 N	3 4 16 E	0 12 17 E	
Liſbon	Eur.	Portugal	38 42 25 N	9 4 40 W	0 36 40 W	2 15
Lion's Bank	Eur.	Atl. Ocean	56 40 0 N	17 45 0 W	1 11 0 W	
Liſburne (Cape)	Aſia	N. Hebrides	15 40 45 S	166 57 0 E	11 7 48 E	
Liverpool	Eur.	England	53 22 0 N	3 10 0 W	0 12 40 W	
Lizard Flagſtaff	Eur.	England	49 57 56 N	5 11 18 W	0 20 45 W	7 30
Lombes	Eur.	France	43 28 30 N	0 55 9 E	0 3 41 E	
London (St. Paul's)	Eur.	England	51 31 0 N	0 5 37 W	0 0 22½ W	3 0

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Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Lorenzo (Cape)	Am.	Peru	1 2 0 S	80 17 0 W	5 21 8 W	
St. Louis (Port)	Am.	Hiſpaniola	18 18 50 N	73 16 0 W	4 53 4 W	
St. Louis (Port)	Africa	Mauritius	20 9 45 S	57 28 0 E	3 49 52 E	
Louiſbourg	Am.	Cape Breton	45 53 40 N	59 55 0 W	3 59 40 W	
Louveau	Aſia	India	12 42 30 N	101 1 30 E	6 44 6 E	
Louvain	Eur.	Netherlands	50 53 3 N	4 44 15 E	0 18 57 E	
Loweſtoffe	Eur.	England	52 29 0 N	1 44 9 E	0 6 57 E	
St. Lucia (Iſle)	Am.	Antilles	13 24 30 N	60 51 30 W	4 3 26 W	
Lunden	Eur.	Sweden	55 42 26 N	13 12 27 E	0 52 50 E	
Luneville	Eur.	France	48 35 33 N	6 30 6 E	0 26 0 E	
Luſon	Eur.	France	46 27 15 N	1 10 34 W	0 4 42 W	
Luxembourg	Eur.	Netherlands	49 37 6 N	6 11 45 E	0 24 47 E	
Lyme Steeple	Eur.	England	51 4 20 N	1 1 22 E	0 4 5 E	
Lynn	Eur.	England	52 45 16 N	0 23 45 E	0 1 35 E	
Lyons	Eur.	France	45 45 52 N	4 49 9 E	0 19 17 E	
M.						
Macao	Aſia	China	22 12 44 N	113 46 15 E	7 35 5 E	
Macaſſar	Aſia	Celebes	5 9 0 S	119 48 45 E	7 59 15 E	
Madeira (Funchal)	Africa	Atl. Ocean	32 37 40 N	16 56 0 W	1 7 44 W	12 4
Madraſs	Aſia	India	13 4 54 N	80 28 4 E	5 21 55 E	
Madre de Dios (Port)	Aſia	Marqueſas	9 55 30 S	139 8 40 W	9 16 35 W	2 30
Madrid	Eur.	Spain	40 25 18 N	3 12 0 W	0 14 8 W	
Magdalena (Iſle)	Aſia	Pacific Ocean	10 25 30 S	138 49 0 W	9 15 16 W	
Mahon (Port)	Eur.	Minorca	39 50 46 N	3 48 30 E	0 15 14 E	
Majorca (Iſle)	Eur.	Mediterr. Sea	39 35 0 N	2 29 45 E	0 9 59 E	
Malacca	Aſia	India	2 12 0 N	102 5 0 E	6 48 20 E	
Malines	Eur.	Netherlands	51 1 50 N	4 28 45 E	0 17 55 E	
Mallicola (Iſle)	Aſia	Pacific Ocean	16 15 30 S	167 39 15 E	11 10 37 E	
St. Maloes	Eur.	France	48 38 59 N	2 2 22 W	0 8 9 W	6 0
Malta (Iſle)	Africa	Mediterr. Sea	35 53 47 N	14 28 30 E	0 57 54 E	
Manilla	Aſia	Philippines	14 36 8 N	120 52 0 E	8 3 28 E	
St. Margaret's Steeple	Eur.	England	51 9 14 N	1 22 7 E	0 5 28 E	
Marigalante (Iſle)	Am.	Atl. Ocean	15 55 15 N	61 11 0 W	4 4 44 W	
Marſeilles	Eur.	France	43 17 43 N	5 21 43 E	0 21 27 E	
St. Martha	Am.	Terra Firma	11 26 40 N	74 4 30 W	4 56 18 W	
St. Martin's (Iſle)	Am.	Carib. Sea	18 4 20 N	63 2 0 W	4 12 8 W	
Martinico (Port-royal)	Am.	Atl. Ocean	14 35 55 N	61 9 0 W	4 4 36 W	
St. Mary's (Iſle)	Eur.	Scilly Iſles	49 57 30 N	6 43 0 W	0 26 52 W	3 45
St. Mary's (Town)	Eur.	Azores	36 56 40 N	25 9 15 W	1 40 37 W	
Maſkelyne's Iſle	Aſia	Pacific Ocean	16 32 0 S	167 59 15 E	11 11 57 E	
St. Matthew (Lights)	Eur.	France	48 19 52 N	4 47 25 W	0 19 10 W	
Mauritius	Africa	Indian Ocean	20 9 45 S	57 29 15 E	3 49 57 E	
Maurua (Iſle)	Aſia	Pacific Ocean	16 25 40 S	152 32 40 W	10 10 11 W	
Mayence	Eur.	Germany	49 54 0 N	8 20 0 E	0 33 20 E	

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The Latitudes and Longitudes of Places.

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			° ′ ″	° ′ ″	h ′ ″	h ′
Mayne (John's) Isle	Eur.	North Ocean	71 10 0 N	9 49 30 W	0 39 18 W	
Mayo (Isle)	Africa	Cape Verd	15 10 0 N	23 5 0 W	1 32 20 W	
Meaux	Eur.	France	48 57 40 N	2 52 30 E	0 11 30 E	
Mecca	Asia	Arabia	21 40 0 N	41 0 0 E	2 44 0 E	
Mende	Eur.	France	44 31 2 N	3 29 35 E	0 13 58 E	
Mergui	Asia	Siam	12 12 0 N	98 8 45 E	6 32 35 E	
Metz	Eur.	France	49 7 10 N	6 10 13 E	0 24 41 E	
Mew Stone	Asia	New Holland	43 48 0 S	146 27 0 E	9 45 48 E	
Mexico	Am.	Mexico	19 25 50 S	100 5 45 W	6 40 23 W	
Mézières	Eur.	France	49 45 47 N	4 43 16 E	0 18 53 E	
Miatea (Isle)	Asia	Pacif. Ocean	17 52 0 S	148 6 0 W	9 52 24 W	
St. Michael's (Isle)	Eur.	Azores	37 47 0 N	25 42 0 W	1 42 48 W	
Middleburgh (Isle)	Asia	Pacific Ocean	21 20 30 S	174 34 0 W	11 38 16 W	
Milan	Eur.	Italy	45 27 57 N	9 11 45 E	0 36 47 E	
Milo (Isle)	Eur.	Mediterr. Sea	36 41 0 N	25 0 0 E	1 40 0 E	
Minorca (fort, St. Philip)	Eur.	Mediterr. Sea	39 51 0 N	3 54 0 E	0 15 36 E	
Modena	Eur.	Italy	44 34 0 N	11 12 30 E	0 44 50 E	
Mons	Eur.	Netherlands	50 27 10 N	3 57 15 E	0 15 49 E	
Montagu (Cape)	Am.	Sandwich Land	58 33 0 S	26 46 0 W	1 47 4 W	
Montagu (Isle)	Asia	Pacific Ocean	17 26 0 S	168 31 30 E	11 14 6 E	
Montmirail	Eur.	France	48 52 8 N	3 32 16 E	0 14 9 E	
Montpellier	Eur.	France	43 36 29 N	3 52 25 E	0 15 30 E	
Montreal	Am.	Canada	45 50 0 N	73 11 0 W	4 52 44 W	
Montferrat (Isle)	Am.	Carib. Sea	16 47 30 N	62 17 0 W	4 9 8 W	
Monument (The)	Asia	Pacific Ocean	17 14 15 S	168 38 15 E	11 14 3 E	
Moscow	Eur.	Moscovy	55 45 45 N	37 32 45 E	2 30 11 E	
Moulins	Eur.	France	46 34 4 N	3 19 59 E	0 13 20 E	
Munich	Eur.	Bavaria	48 9 55 N	11 30 0 E	0 46 0 E	
Musketto Cove	Am.	Greenland	64 55 13 N	52 56 45 W	3 31 47 W	10 15
Muswell Hill	Eur.	England	51 35 32 N	0 7 20 W	0 0 29 W	
N.						
Namur	Eur.	Netherlands	50 28 32 N	4 44 45 E	0 18 59 E	
Nancy	Eur.	France	48 41 55 N	6 10 16 E	0 24 41 E	
Nangasachi	Asia	Japan	32 32 0 N	128 46 15 E	8 35 5 E	
Nankin	Asia	China	32 4 40 S	118 47 0 E	7 55 8 E	
Nantes	Eur.	France	47 13 6 N	1 32 59 W	0 6 12 W	3 0
Naples	Eur.	Italy	40 50 15 N	14 17 30 E	0 57 10 E	
Narbonne	Eur.	France	43 10 58 N	2 59 59 E	0 12 0 E	
Nevers	Eur.	France	46 59 17 N	3 9 16 E	0 12 37 E	
New Year's Harbour	Am.	Staten Land	54 48 55 S	64 11 0 W	4 16 44 W	
Niagara	Am.	Canada	43 4 25 N	79 7 51 W	5 16 31 W	
Nice	Eur.	France	43 41 47 N	7 16 22 E	0 29 5 E	
St. Nicholas Mole	Am.	Hispaniola	19 49 20 N	73 29 45 W	4 53 59 W	
Nieuport	Eur.	Flanders	51 7 41 N	2 45 0 E	0 11 0 E	12 0
Ningpo	Asia	China	29 57 45 N	120 18 0 E	8 1 12 E	
Nismes	Eur.	France	43 50 12 N	4 18 39 E	0 17 15 E	

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			° ′ ″	° ′ ″	h ′ ″	h ′
Noir (Cape)	Amer.	Terra del Fuego	54 32 30 S	73 3 15 W	4 48 13 W	
Nootka	Amer.	Pacific Ocean	49 36 6 N	126 42 30 W	8 26 50 W	
Norfolk island	Asia	Pacific Ocean	29 1 45 N	168 10 0 E	11 12 40 E	
Noriton	Amer.	Pensylvania	40 9 56 N	75 23 30 W	5 1 34 W	
North Cape	Eur.	Lapland	71 10 0 N	25 57 0 E	1 43 48 E	3 0
Cape North	Amer.	South Georgia	54 4 35 N	38 15 0 W	2 33 0 W	
Noyon	Eur.	France	49 34 59 N	3 59 48 E	0 11 59 E	
Nuremberg	Eur.	Germany	49 26 55 N	11 4 0 E	0 44 16 E	
O.						
Oaitipeha Bay	Asia	Otaheite	17 29 17 S	149 35 45 W	9 56 57 W	
Ochoz	Asia	Tartary	59 20 10 N	143 12 30 E	9 32 50 E	
Ohamaneno Harbour	Asia	Uliateah	16 45 30 S	151 38 5 W	10 6 32 W	11 20
Ohevahoa (Isle)	Asia	Pacific Ocean	9 40 40 S	139 1 40 W	9 16 7 W	
Ohitahoo (Isle)	Asia	Pacific Ocean	9 55 30 S	139 6 0 W	9 16 24 W	2 30
Oleron (Isle)	Eur.	France	46 2 50 N	1 25 13 W	0 5 41 W	
Olinde	Amer.	Brazil	8 13 0 S	35 5 30 W	2 20 22 W	
St. Omer's	Eur.	Flanders	50 44 46 N	2 14 57 E	0 9 0 E	
Onateayo (Isle)	Asia	Pacific Ocean	9 58 0 S	138 51 0 W	9 15 24 W	
Oporto	Eur.	Portugal	41 10 0 N	8 22 0 W	0 33 8 W	
Orenburg	Asia	Tartary	51 46 5 N	55 4 30 E	3 40 18 E	
Orleans	Eur.	France	47 54 10 N	1 54 27 E	0 7 38 E	
Orleans (New)	Am.	Louisiana	29 57 45 N	89 58 45 W	5 59 55 W	
Oratava	Africa	Teneriffe	28 23 27 N	16 24 11 W	1 5 37 W	
Orsk	Asia	Tartary	51 12 30 N	58 30 45 E	3 54 3 E	
Ortagal (Cape)	Eur.	Spain	43 46 30 N	7 39 0 W	0 30 36 W	
Osnaburg (Isle)	Asia	Pacific Ocean	17 49 30 S	149 26 15 W	9 52 24 W	
Ostend	Eur.	Netherlands	51 13 55 N	2 55 45 E	0 11 43 E	12 9
Owharre Bay	Asia	Huahine	16 44 0 S	151 8 15 W	10 4 33 W	
Oxford (Observatory)	Eur.	England	51 45 38 N	1 15 30 W	0 5 2 W	
P.						
Padua	Eur.	Italy	45 23 40 N	11 52 30 E	0 47 30 E	
Paita	Am.	Peru	5 12 0 S			
Pallifer's (Isles)	Asia	Pacific Ocean	15 38 15 S	146 30 15 W	9 46 1 W	
Pallifer (Cape)	Asia	New Zealand	41 38 0 S	175 18 0 E	11 44 30 E	
Palma (Isle)	Africa	Canaries	28 36 45 N	17 50 0 W	1 11 20 W	
Palmerston's (Isle)	Asia	Pacific Ocean	18 0 0 S	162 57 0 W	10 51 48 W	
Panama	Am.	Mexico	8 47 48 N	80 21 0 W	5 21 24 W	
Paoom (Isle)	Asia	Pacific Ocean	16 30 0 S	168 28 45 E	11 13 55 E	
Paris (Observ.)	Eur.	France	48 50 14 N	2 20 0 E	0 9 20 E	
Patrixfiord	Eur.	Iceland.	65 35 45 N	24 10 0 W	1 36 40 W	
Pau	Eur.	France	43 15 0 N	0 9 0 W	0 0 36 W	
St. Paul's (Isle)	Africa	Indian Ocean	37 51 0 S	77 48 0 E	5 11 12 E	
St. Paul de Léon	Eur.	France	48 40 55 N	4 0 21 W	0 16 1 W	4 0

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			° ′ ″	° ′ ″	h ′ ″	h ′
Pekin	Asia	China	39 54 13 N	116 27 30 E	7 45 50 E	
Perigueux	Eur.	France	45 11 8 N	0 43 9 E	0 2 53 E	
Perinaldi	Eur.	Italy	43 53 20 N	7 40 0 E	0 30 40 E	
Perpignan	Eur.	France	42 41 53 N	2 53 35 E	0 11 34 E	
St. Peter's Fort	Am.	Martinico	14 44 0 N	61 21 16 W	4 5 25 W	
St. Peter's (Isle)	Am.	Atl. Ocean	46 46 30 N	56 17 0 W	3 45 8 W	
Petersburg	Eur.	Russia	59 56 23 N	30 19 0 E	2 1 16 E	
Petit Goave	Am.	Hispaniola	18 27 0 N	72 52 30 W	4 51 30 W	
Petropawloskoi	Asia	Kamchatka	53 1 20 N	158 48 0 E	10 35 13 E	
Philadelphia	Amer.	Pensylvania	39 56 55 N	75 13 30 W	5 0 54 W	
St. Philip's Fort	Eur.	Minorca	39 50 46 N	3 48 30 E	0 15 14 E	
Pickersgill's (Isle)	Amer.	Atl. Ocean	54 42 30 S	36 58 0 W	2 27 52 W	
Pickersgill's Harbour	Asia	N. Zealand	45 47 27 S	166 18 9 E	11 5 13 E	
Pico	Eur.	Azores	38 28 40 N	28 26 0 W	1 53 44 W	
Pines (Isle)	Asia	N. Caledonia	22 38 0 S	167 38 0 E	11 10 32 E	
Pisa	Eur.	Italy	43 43 7 N	10 23 0 E	0 41 32 E	
Plymouth Garrison	Eur.	England	50 21 22 N	4 7 24 W	0 16 30 W	6 0
Poitiers	Eur.	France	46 34 50 N	0 20 48 E	0 1 23 E	
Pollingen	Eur.	Germany	47 48 17 N	11 7 17 E	0 44 29 E	
Poole Church	Eur.	England	50 42 50 N	1 58 55 W	0 7 56 W	
Pondicherry	Asia	India	11 41 55 N	79 52 45 E	5 19 31 E	
Ponoi	Eur.	Lapland	67 4 30 N	36 23 15 E	2 25 33 E	
Pontoise	Eur.	France	49 3 2 N	2 5 37 E	0 8 22 E	
Portland Light-house	Eur.	England	50 31 22 N	2 26 49 W	0 9 47 W	
Porto Bello	Amer.	Mexico	9 33 5 N	79 50 20 W	5 19 21 W	
Porto Sancto (Isle)	Africa	Madeira	32 58 15 N	16 25 15 W	1 5 41 W	
Port Royal	Am.	Jamaica	18 0 0 N	76 45 30 W	5 7 2 W	
Port Royal	Am.	Martinico	14 35 55 N	61 9 0 W	4 4 36 W	
Portsmouth Church	Eur.	England	50 47 27 N	1 5 57 W	0 4 24 W	11 15
Portsmouth Academy	Eur.	England	50 48 2 N	1 6 1 W	0 4 24 W	
Portland (Isle)	Eur.	North Sea	63 22 0 N	18 54 0 W	1 15 36 W	
Portland (Isle)	Asia	Pacific Ocean	39 25 0 S	178 12 0 E	11 52 48 E	
Port Paix	Am.	Hispaniola	19 58 0 N	73 2 0 W	4 48 8 W	
Port Praya	Africa	St. Jago	14 53 53 N	23 29 22 W	1 33 57 W	11 0
Prague	Eur.	Bohemia	50 5 47 N	14 24 0 E	0 57 36 E	
Prin. of Wales's Fort	Am.	New Wales	58 47 32 N	94 7 30 W	6 16 30 W	
Providence	Am.	N. England	41 50 40 N	71 26 0 W	4 45 44 W	
Pudyoua	Asia	N. Caledonia	20 18 0 S	164 41 14 E	10 58 45 E	6 30
Pulo Condor (Isle)	Asia	Indian Ocean	8 40 0 N	107 20 0 E	7 9 20 E	
Pulo Timon (Isle)	Asia	Gulph Siam	3 30 0 N	104 25 0 E	6 57 40 E	
Pylestaart's (Isle)	Asia	Pacific Ocean	22 23 0 S	175 41 30 W	11 42 46 W	

The Latitudes and Longitudes of Places.

Q.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Quebec	Am.	Canady	46 47 30 N	71 10 0 W	4 44 40 W	7 30
Quimper	Eur.	France	47 58 29 N	4 6 0 W	0 16 24 W	
St. Quinton	Eur.	France	49 50 51 N	3 17 23 E	0 13 10 E	
Quiros (Cape)	Asia	N. Hebrides	14 56 8 S	167 20 0 E	11 9 20 E	
Quinto	Am.	Peru	0 13 17 S	77 55 0 W	5 11 40 W	

R.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
Rakah (Ancient)	Asia	Mesopatamia	36 1 0 N	38 50 0 E	2 35 20 E	
Ramhead	Eur.	England	50 18 40 N	4 20 15 W	0 17 21 W	
Ramsgate Windmill	Eur.	England	51 19 49 N	1 24 4 E	0 5 36 E	
Re (Isle)	Eur.	France	46 14 48 N	1 34 28 W	0 6 18 W	3 0
Recif	Am.	Brazil	8 10 0 S	35 35 0 W	2 22 20 W	
Reikianess (Cape)	Eur.	Iceland	63 55 0 N	22 47 30 W	1 31 10 W	
Rennes	Eur.	France	48 6 45 N	1 41 53 W	0 6 48 W	
Resolution (Bay)	Asia	Ohitahoo	9 55 30 S	139 8 40 W	9 16 35 W	2 30
Resolution (Isle)	Asia	Pacific Ocean	17 23 30 S	141 45 0 W	9 27 0 W	
Resolution (Port)	Asia	Tanna	19 32 25 S	169 41 5 E	11 18 44 E	
Rheims	Eur.	France	49 15 16 N	4 1 48 E	0 16 7 E	
Rhodes	Eur.	France	44 20 59 N	2 34 17 E	0 10 17 E	
Rhodes	Asia	Archipelago	35 27 0 N	28 45 0 E	1 55 0 E	
Rimini	Eur.	Italy	44 3 43 N	12 34 15 E	0 50 17 E	
Rio Janeiro	Am.	Brasil	22 54 10 S	42 43 45 W	2 50 55 W	
Rochelle	Eur.	France	46 9 21 N	1 9 55 W	0 4 40 W	3 45
Rochford	Eur.	France	45 56 10 N	0 57 49 W	0 3 51 W	4 15
Rock of Lisbon	Eur.	Portugal	38 45 30 N	9 35 30 W	0 38 22 W	
Rodrigues (Isle)	Africa	Indian Ocean	19 40 40 S	63 10 0 E	4 12 40 E	
Rome (St. Peter's)	Eur.	Italy	41 53 54 N	12 29 15 E	0 49 57 E	
Rotterdam	Eur.	Holland	51 55 58 N	4 29 0 E	0 17 56 E	3 0
Rotterdam (Isle)	Asia	Pacific Ocean	20 16 30 S	174 30 30 W	11 38 2 W	
Rouen	Eur.	France	49 26 27 N	1 1 32 W	0 4 6 W	1 15

S.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
Saba (Isle)	Am.	Carib. Sea	17 39 30 N	63 17 15 W	4 13 9 W	
Sable (Cape)	Am.	Nova Scotia	43 23 45 N	65 39 15 W	4 22 37 W	
Sagan	Eur.	Silesia	51 42 12 N	15 22 15 E	1 1 29 E	
Saintes	Eur.	France	45 44 43 N	0 38 54 W	0 2 36 W	
Sainte-Croix	Eur.	France	48 0 35 N	7 23 55 E	0 29 36 E	
Salisbury Spire	Eur.	England	51 3 49 N	1 47 0 W	0 7 8 W	
Sall (Isle)	Africa	Atl. Ocean	16 38 15 N	22 56 15 W	1 31 45 W	
Salonique	Eur.	Turkey	40 41 10 N	23 8 0 E	1 32 32 E	
Salvages (Isles)	Africa	Atl. Ocean	30 0 0 N	15 54 0 W	1 3 36 W	

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Samana	Amer.	Hiſpaniola	19 15 0 N	69 16 30 W	4 37 6 W	
Samos	Aſia	Archipelago	37 46 0 N	27 13 0 E	1 48 52 E	
Sancta Cruz	Africa	Teneriffe	28 27 30 N	16 16 15 W	1 5 5 W	
Sandwich (Bay)	Amer.	South Georgia	54 42 0 S	36 12 0 W	2 24 48 W	
Sandwich (Cape)	Aſia	Mallicola	16 28 0 S	167 59 0 E	11 11 56 E	
Sandwich Harbour	Aſia	Mallicola	16 25 20 S	167 53 0 E	11 11 32 E	
Sandwich (Iſle)	Aſia	Pacific Ocean	17 41 0 S	168 33 0 E	11 14 12 E	
Saunder's (Cape)	Amer.	Sandw. Land	54 6 30 S	36 57 30 W	2 27 50 W	
Saunder's (Iſle)	Amer.	South Georgia	58 0 0 S	26 58 0 W	1 47 52 W	
Savage (Iſle)	Aſia	Pacific Ocean	19 2 15 S	169 30 30 W	11 18 2 W	
Scarborough Head	Eur.	England	54 18 0 N	0 13 0 W	0 0 52 W	
Schwezingen	Eur.	Germany	49 23 4 N	8 40 45 E	0 34 23 E	
Scilly Iſles (Lights)	Eur.	Eng. Channel	49 56 0 N	6 46 0 W	0 27 4 W	
Sebaſtian St. (Cape)	Africa	Madagaſcar	12 30 0 S	46 25 0 E	3 5 40 E	
Sedan	Eur.	France	49 42 29 N	4 57 36 E	0 19 50 E	
Seez	Eur.	France	48 36 [illegible] N	[illegible] 10 44 E	0 0 43 E	
Senegal	Africa	Negroland	15 53 0 N	16 31 30 W	1 6 6 W	10 30
Senlis	Eur.	France	49 12 [illegible] N	2 34 58 E	0 10 20 E	
Sens	Eur.	France	48 [illegible] 55 N	3 17 21 E	0 13 6 E	
Senonea	Eur.	France	48 23 7 N	[illegible] 57 0 E	0 27 48 E	
Sheerneſs	Eur.	England	51 25 0 N	0 50 0 E	0 3 20 E	
Shepherd's (Iſles)	Aſia	Paciſ. Ocean	16 58 0 S	168 42 0 E	11 14 48 E	
Shirburn Caſtle	Eur.	England	51 39 25 N	1 0 0 W	0 4 0 W	
Siam	Aſia	India	14 20 40 N	100 50 0 E	0 43 20 E	
Si-ngham-ſu	Aſia	China	34 16 30 N	108 43 45 E	7 14 55 E	
Sifteron	Eur.	France	44 11 51 N	5 56 18 E	0 23 45 E	
Sligo Bay	Eur.	Ireland	54 15 0 N	9 18 0 W	0 37 12 W	
Smyrna	Aſia	Natolia	38 28 7 N	27 6 35 E	1 48 26 E	
Snæfell (Mount)	Eur.	Iceland	64 52 20 N	23 54 0 W	1 35 36 W	
Soiſſons	Eur.	France	49 22 52 N	3 19 16 E	0 13 17 E	
Sombavera (Iſles)	Am.	Carib. Sea	18 38 0 N	63 37 30 W	4 14 30 W	
Soolo	Aſia	India	5 57 0 N	121 15 30 E	8 5 2 E	
Southampton Spire	Eur.	England	50 93 59 N	1 23 56 W	0 5 36 W	
Southern Thule	Am.	Sandw. Land	59 34 0 S	27 45 0 W	1 51 0 W	
Speaker Bank	Aſia	Indian Ocean	4 45 0 S	72 57 0 E	4 51 48 E	
Stalbridge	Eur.	England	50 57 0 N	2 23 30 W	0 9 34 W	
Start-Point	Eur.	England	50 13 26 N	3 38 21 W	0 14 33 W	
Stockholm	Eur.	Sweden	59 20 31 N	18 3 55 E	1 12 16 E	
Stonehenge	Eur.	England	51 10 44 N	1 49 8 W	0 7 16 W	
Straumnaſa	Eur.	Iceland	65 39 40 N	24 29 15 W	1 37 57 W	
Stratſbourgh	Eur.	France	48 34 56 N	7 44 36 E	0 30 58 E	
Succeſs Bay	Am.	Terra del Fuego	54 49 45 S	65 25 0 W	4 21 40 W	
Succeſs Cape	Am.	Terra del Fuego	55 1 0 S	65 27 0 W	4 21 48 W	
Suez	Africa	Egypt	29 50 0 N	33 27 0 E	2 13 48 E	
Sultz	Eur.	France	47 53 10 N	7 14 32 W	0 28 58 W	
Surat	Aſia	India	21 10 0 N	72 22 30 E	4 49 30 E	

The Latitudes and Longitudes of Places.

T.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Table Iſland	Aſia	N. Hebrides	15 38 0 S	167 7 0 E	11 8 28 E	
Tanna	Aſia	Pacific Ocean	19 32 25 S	169 41 5 E	11 18 44 E	3 0
Taonkaa (Iſle)	Aſia	Pacific Ocean	14 30 30 S	145 9 30 W	9 40 38 W	
Taraſcon	Eur.	France	43 48 20 N	4 39 36 E	0 18 38 E	
Tarbes	Eur.	France	43 13 52 N	0 3 59 E	0 0 16 E	
Taſſacorta	Africa	Iſle Palma	28 38 0 N	17 58 0 W	1 11 52 W	
Temontengis	Aſia	Soloo	5 57 0 N	120 53 30 E	8 3 34 E	
Teneriffe (Peak)	Africa	Canaries	28 17 0 N	16 40 0 W	1 6 40 W	
Tercera	Eur.	Azores	38 45 0 N	27 6 0 W	1 48 24 W	
Texel Iſle	Eur.	Holland	53 10 0 N	4 59 0 E	0 19 56 E	
Thionville	Eur.	France	49 21 30 N	6 10 30 E	0 24 42 E	
Thomas St. (Iſle)	Amer.	Virgin Iſles	18 21 55 N	64 51 30 W	4 19 26 W	
Thule (Southern)	Amer.	Sandwich Land	59 34 0 S	27 45 0 W	1 51 0 W	
Thury	Eur.	France	49 21 28 N	2 18 30 E	0 9 14 E	
Timor (S. W. Point)	Aſia	India	10 23 0 S	123 59 0 E	8 15 56 E	
Timor Land (S. Poi.)	Aſia	India	8 15 0 S	131 54 0 E	8 47 36 E	
Tobolſki	Aſia	Siberia	58 12 30 N	68 25 0 E	4 33 40 E	
Tolaga Bay	Aſia	New Zealand	38 21 30 S	178 33 45 E	11 58 15 E	
Toledo	Eur.	Spain	39 50 0 N	3 20 0 W	0 13 20 W	
Tomſk	Aſia	Siberia	56 30 0 N	84 59 30 E	5 39 58 E	
Tonga Tabu (Iſle)	Aſia	Pacific Ocean	21 9 0 S	174 46 0 W	11 39 4 W	
Tonnerre	Eur.	France	47 51 8 N	3 58 44 E	0 15 59 E	
Torbay	Eur.	England	50 34 0 N	3 36 0 W	0 14 24 W	
Tornea	Eur.	Sweden	65 50 50 N	24 12 0 E	1 36 48 E	
Toulon	Eur.	France	43 7 16 N	5 55 26 E	0 23 42 E	
Touloufe	Eur.	France	43 35 46 N	1 26 21 E	0 5 45 E	
Tournan	Eur.	France	48 43 57 N	2 45 15 E	0 11 1 E	
Toura	Eur.	France	47 23 46 N	0 41 32 E	0 2 46 E	
Traitor's Head	Aſia	Erramanga	18 43 30 S	169 20 30 E	11 17 22 E	
Trieſte	Eur.	Adriatic Sea	45 51 0 N	14 3 0 E	0 56 12 E	
Trinidad	Am.	Atl. Ocean	20 15 0 S	126 42 0 W	8 26 48 W	
Tripoli	Africa	Barbary	32 53 40 N	13 5 15 E	0 52 21 E	
Troyes	Eur.	France	48 18 5 N	4 4 34 E	0 16 18 E	
Turin	Eur.	Italy	45 4 14 N	7 40 0 E	0 30 40 E	
Turnagain (Cape)	Aſia	N. Zealand	40 28 0 S	176 56 0 E	11 47 44 E	
Turtle Iſland	Aſia	Pacific Ocean	19 48 45 S	177 57 0 W	11 51 48 W	
Tyrnaw	Eur.	Hungary	48 23 30 N	17 33 45 E	1 10 15 E	

The Latitudes and Longitudes of Places.

U.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Uliateah	Asia	Pacific Ocean	16 45 0 S	151 31 0 W	10 6 4 W	
Uofal	Eur.	Sweden	59 51 50 N	17 38 45 E	1 10 35 E	
Uraniberg	Eur.	Denmark	55 54 38 N	12 42 44 E	0 50 51 E	
Ushant	Eur.	France	48 28 30 N	5 4 33 W	0 20 18 W	4 30

V.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
Valenciennes	Eur.	France	50 21 27 N	3 31 40 E	0 14 18 E	
Valery St.	Eur.	France	50 11 13 N	1 37 6 E	0 6 28 E	
Vallery St.	Eur.	France	49 52 12 N	0 41 10 E	0 2 45 E	
Valparaiso	Am.	Chili	33 2 36 S	72 19 15 W	4 49 17 W	
Van Dieman's Road	Asia	Tonga Tabu	21 4 15 S	174 56 24 W	11 39 46 W	
Vannes	Eur.	France	47 39 14 N	2 46 26 W	0 11 17 W	
Vence	Eur.	France	43 43 16 N	7 7 28 E	0 28 30 E	
Venice	Eur.	Italy	45 26 7 N	12 22 45 E	0 49 31 E	
Venua (Point)	Asia	Otaheite	17 29 17 S	149 35 45 W	9 58 23 W	10 38
Vera Cruz	Am.	Mexico	19 9 38 N	96 0 0 W	6 24 0 W	
Verd (Cape)	Afric.	Negroland	14 43 45 N	17 30 45 W	1 10 3 W	
Verdun	Eur.	France	49 9 24 N	5 22 41 E	0 21 31 E	
Verona	Eur.	Italy	45 26 7 N	11 18 30 E	0 45 14 E	
Versailles	Eur.	France	48 48 21 N	2 7 7 E	0 8 28 E	
Vienna (Observ.)	Eur.	Hungary	48 12 36 N	16 16 22 E	1 5 30 E	
Vigo	Eur.	Spain	42 14 24 N	8 28 0 W	0 33 52 W	
Vincent St. (Cape)	Eur.	Spain	37 3 0 N	8 59 26 W	0 35 58 W	
Vintimiglia	Eur.	Italy	43 53 20 N	7 37 30 E	0 30 30 E	
Virgin Gorda (Fort)	Am.	West Indies	18 18 0 N	64 0 0 W	4 16 0 W	
Virgin (Cape)	Am.	Patagonia	52 23 0 S	67 54 0 W	4 31 36 W	
Viviers	Eur.	France	44 28 57 N	4 40 55 E	0 18 44 E	
Vurtzburg	Eur.	Franconia	49 46 6 N	10 13 45 E	0 40 55 E	

W.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
Wakefield	Eur.	England	53 41 0 N	1 33 30 W	0 6 14 W	
Prince of Wales's Fort	Am.	New Wales	58 47 30 N	94 7 30 W	6 16 30 W	
Wanstead	Eur.	England	51 34 10 N	0 2 30 E	0 0 10 E	
Wardhus	Eur.	Lapland	70 22 36 N	31 6 45 E	2 4 27 E	
Warsaw	Eur.	Poland	52 14 28 N	21 0 0 E	1 24 2 E	
Westman (Isles)	Eur.	North Ocean	63 20 30 N	20 27 45 W	1 21 51 W	
Wexford	Eur.	Ireland	52 22 0 N	6 30 0 W	0 26 0 W	
Weymouth	Eur.	England	52 40 0 N	2 34 0 W	0 9 36 W	
Whitehaven	Eur.	England	54 25 0 N	3 15 0 W	0 13 0 W	
Whitsuntide (Isle)	Asia	Pacific Ocean	15 44 20 S	168 20 15 E	11 13 21 E	

The Latitudes and Longitudes of Places.

Names of Places.	Cont.	Sea or Country.	Latitude.	Longitude. In Degrees.	Longitude. In Time.	H. Wat.
			° ′ ″	° ′ ″	h ′ ″	h ′
Willliam (Fort)	Afia	Bengal	22 34 45 N	88 29 30 E	5 53 58 E	
Willis's (Iſles)	Am.	South Georgia	54 0 0 S	38 29 40 W	2 33 59 W	
Wilna	Eur.	Poland	54 41 0 N	25 27 30 E	1 41 50 E	
Wittenburg	Eur.	Germany	51 53 0 N	12 44 30 E	0 50 58 E	
Wologda	Eur.	Ruſſia	59 19 0 N			
Worceſter	Eur.	England	52 9 30 N	2 0 15 W	0 8 1 W	
Woſlak	Eur.	Ruſſia	61 15 0 N			
Wyke Church	Eur.	England	50 35 57 N	2 28 10 W	0 9 53 W	
Y.						
Ylo	Am.	Peru	17 36 15 S	71 13 0 W	4 44 52 W	
York	Eur.	England	53 59 0 N	1 6 40 W	0 4 27 W	
York (New)	Am.	Jerſey	40 40 0 N	74 11 0 W	4 56 54 W	3 0
Yorkminſter	Am.	Terra del Fuego	55 26 20 S	70 8 0 W	4 40 32 W	

ON THE

ORIGIN OF ASTRONOMY

AND

GEOGRAPHY.

THE chief difficulty in any elementary work of ſcience is, to catch the ideas which lead from ignorance to knowledge; but in moſt works of this nature, the author ſeems to infer that the reader is in a conſiderable degree acquainted with the ſubject; and, while he is in the ſhip of ſcience, expects that the diſciple can arrive without a boat. The moſt profound authors are commonly the moſt aware of this difficulty; and the following extract, tranſlated from Bailly's learned Hiſtory of Ancient Aſtronomy,* will be found uſeful, as preſenting the original ideas which led to the ſciences of Aſtronomy and Geography.

§ 1. Few people have not been impreſſed with the beauty of the nocturnal firmament. The ſight, fatigued with the ſplendour of day, wanders over the celeſtial vault, and enjoys the complaiſance of ſoft repoſe; a deep azure ſerves as a foil to the enchaſed diamonds; the different luſtre of the ſtars, ſome ſparkling, others reſembling glittering particles, but compenſating in number what they loſe in ſize; the gently luminous zone which ſurrounds the ſky, and divides it into two portions; the large ſilver planet, which, varying in its appearance, ſometimes preſents a creſcent, ſometimes a radiant and full globe, whoſe ſoft beams delight the eye, without fatiguing it, a globe, which in ſize and ſplendour can alone be compared to the ſun, advancing with equal majeſty, while numerous ſtars diſappear in the ſuperior effulgence. Such is the ſpectacle preſented by night, till the dawn begin to glimmer in the eaſt; the ſky reddens, and the ſun ſprings from the horizon. All the ſtars diſappear, he fills the entire firmament which he traverſes, diffuſing light and heat till he deſcend towards the horizon, where he terminates his courſe; and the grand ſcenes of night are repeated. Such regularity, ſuch ſublimity, joined with ſo much ſimplicity, excite the admiration of the coldeſt and moſt inſenſible minds.

§ 2. This phenomenon of the motion of the ſun from eaſt to weſt was the firſt obſerved, and was followed by that of the general motion of the ſtars in the ſame direction. All appear in the eaſt in the evening, and advance in regular order, traverſing the heavens like the ſun, till concealed by the oppoſite horizon. The firſt idea was, to regard the firmament as a vaſt pavilion ſpread over a plane ſuperficies; the next was that of a hemiſphere turning upon itſelf with the attached ſtars, while the ſun himſelf was ſubjected to the movement. But a great queſtion aroſe, what became of the ſun during the night, and of the ſtars during the day? A conſiderable time was required to reſolve this queſtion; and as all depends on circumſtances and means, it was even an effort of genius; nor was it completely explained till

* Paris 1781, 4to.

the rotundity of the earth, surrounded on all sides by the firmament, had been acknowledged. It is well known that many great philosophers seriously wrote and thought that the sun passed the night in the sea; and that the stars were extinguished in the morning, to be rekindled in the evening. It was even said, that at the moment when the sun set, a certain noise was heard as if the sea hissed, when the sun was extinguished in the descent under the waves. It is to the celebrated Greeks, and to their academies, that we owe these fond tales which shall not occupy our attention.

§ 3. It was soon perceived that the moon had a particular motion. One night she had appeared near a star, and on the following was at a distance. It was not difficult to observe that the stars always preserved the same distance, so that the motion could only be ascribed to the moon herself. Thus the knowledge of a particular motion from west to east was joined to that of the general motion from east to west: and this was the first discovery in astronomy.

The phases of the moon formed at the same time a phenomenon which attracted the attention of the first astronomers, but which exercised their sagacity more than the other. They began with following and studying her appearances, and the following must have been the first observations. When the moon begins to shew herself, it is in the evening after sun-set. She presents the form of a crescent, or delicate thread of light in a circular form, the convexity being towards the sun, while the points are turned towards the east. This crescent soon enlarges, and the moon, at a greater distance from the sun, remains longer in the firmament. By insensible augmentation the enlightened part assumes the appearance of half a disk; and when the night arrives she then occupies the middle of the heavens. At the end of about fourteen days from her first appearance, she is opposite to the sun, rising when he sets, and is full, like a disk completely enlightened, so that, incapable of increase, it must decline. The light first vanishes from that side where it first appeared, and diminishes gradually as it had increased. The moon becomes successively like half a disk, then a crescent, more and more narrow, but with the horns turned towards the west, the convexity regarding the sun, which the moon then precedes, only rising a short time before him. Soon after she ceases to rise, she is two or three days invisible; and then re-appears to undergo the same changes.

In combining these different phenomena, it was observed, that when the moon was in her greatest splendor, she was opposite to the sun; and when she was near the sun, the enlightened part was turned towards that star. It was natural to conclude that her illumination depended on the sun, and that her light was borrowed from him. As to the body of the moon, it was impossible to dispute its rotundity; and this body must either be a flat disk or a sphere, which, seen at a distance, has the same appearance. But a flat disk would not be illuminated like the moon, but entirely from the first, and only more feebly by oblique than by direct rays; while all spherical bodies are enlightened only on one side, and upon looking on the side and the front, the phases of the moon became easily explicable. It was therefore proved that the moon was a round or spherical body.

§ 4. Attentive and assiduous observers soon perceived that the spectacle of the starry heavens was not always the same. At the end of six months it is almost absolutely changed; the stars which rose at a certain hour being then ready to set, while new stars appear in the east. By means of daily attention it was observed that all the stars rise every day sooner than they did the day before, and that at the end of a month the difference amounts to two hours. This anticipation in the rising of the stars, must be the effect of some unknown motion: it was at first doubtless imagined that the firmament, the starry heaven, besides the daily motion around the earth from east to west, had another slower motion in the same direction, so as to accelerate the rising and setting of the stars. But what became of the stars that were invisible during many months, and whence proceeded the stars which began to appear on the horizon? Some remarks, accumulated by time, lessened these difficulties. It was observed that some of the stars, for example, those of the Great Bear, sometimes appeared in the east, sometimes in the west, north or south, while other stars never appeared in the north. It was inferred that the first made an entire revolution; but why should the others have a different march, or so to speak, a particular privilege? It was even perceived that there was one star which did not sensibly change its situation during the whole course of the night. It was as it were the centre of motion, while the others seemed to turn around it; hence the point it occupied in the firmament was called the *Pole*, and this star assumed the name of the Polar Star. Around this immoveable star, some made an entire revolution, while others only seemed to accomplish a part. More profound speculators followed these last beyond their apparition, and supplied by imagination that portion of their course which was inobservable by the eye. The firmament became a complete sphere, and as two fixed points were necessary for its motion, they supposed, in imitation of the visible pole, another fixed point diametrically opposite under the earth in the other part of the firmament; and the imaginary line which joined these two points, and around which the diurnal motion was accomplished, was called the *Axis of the Sphere*.

It had been moreover remarked, that when a new star appeared, it was always in the morning, when it seemed to precede the day, and to quit the sun in order to pass before him. On the contrary, when it ceased to shew itself, when it began to escape from the sight, it was always at sun-set, and it might be judged that it was about to rejoin that star. It was, therefore, the presence of the sun which made it disappear; and on their separation depended its new appearance. Thus all was explained. The sun and the stars, when they disappeared in the west, passed under the earth to re-appear in the

eaſt. Beſides, the ſtars and the ſun were obſerved to have a motion by which they ſeemed to quit each other, and afterwards to approach. It was enquired if this motion belonged to the ſun or to the ſtars, and it was more ſimple to conceive the motion of the ſun, than that of a multitude of ſtars, which muſt make an equal progreſs. Analogy alſo threw light on this topic, and the motion of the moon ſhewed that the latter, which bore a ſtrict reſemblance, belonged to the ſun.

§ 5. He who diſcovered the ſpherical form of the firmament, and the motion of the ſun, made two grand ſteps in aſtronomy, for on theſe depend the baſes of the ſphere, and they diſembarraſs the ſtudy from many errors and abſurd ideas. When we conſider the epochs and the circumſtances, Copernicus and Kepler, when they changed the ſyſtem of the world, and the form of the planetary orbits, did not render a greater ſervice to the ſcience.

All theſe conſiderations on the ſtars, ſerved to certify that the greater number was *fixed* in the firmament; that is to ſay, that in ſpite of the general motion, they preſerved the ſame diſtances and the ſame configurations. Nevertheleſs, among thoſe which by their ſplendour attracted particular attention, and which were ſtyled of the firſt magnitude, three were diſtinguiſhed, which changed their diſtances with regard to the reſt. They had, therefore, like the moon, a proper motion, each in the ſame direction from weſt to eaſt; but all three of different ſwiftneſs. A diſtinction was thus eſtabliſhed of two kinds of ſtars, the firſt being regarded as fixed, becauſe they ſeemed only to move with the firmament, and the others were called *Planets*, implying wandering ſtars. The three firſt known were doubtleſs Mars, Jupiter, and Saturn. A very brilliant ſtar, which ſometimes appears in the evening, was alſo claſſed with the planets, having a motion with regard to the fixed ſtars. A ſecond ſtar, which appeared in the morning before ſun riſe, perfectly reſembling the former in luſtre, and having like it a peculiar motion, was at firſt regarded as a different planet. The evening ſtar was diſtinguiſhed from the morning ſtar, *Heſper* from *Lucifer*; nevertheleſs they were of ſuch equal ſplendour, and it was ſo viſible that the morning ſtar completed the rout begun by that of the evening, that a little time and attention evinced that theſe two ſtars were the ſame planet, now called Venus. Another ſtar of much ſmaller ſize, which alſo appeared in the morning and the evening, was placed in the rank of planets. Thus the ancients knew ſeven planets, the ſun, the moon, Mars, Jupiter, Saturn, Venus, and Mercury. They had only been obſerved ſucceſſively, and perhaps after the elapſe of many ages, above all, Mercury, which is almoſt always merged in the ſolar rays. The diſcoveries are here united, becauſe ſome led to others, although they were ſeparated by long intervals of time.

§ 6. The ſpherical form of the firmament being acknowledged, it was alſo natural to think that the earth was round. It was clear that it was ſuſpended in the middle of ſpace, becauſe the ſtars paſſed under it. The firmament, which was believed to be ſolid, ſeemed an envelope made for the earth; and in conſequence both ſhould have the ſame form. Beſides, the ancients, always pre-occupied with the advantages of circular forms above all others, naturally applied them to the earth and to the ſtars; which laſt they believed to be formed of a divine ſubſtance, or at leaſt deſtined for the abodes of gods and ſpirits. To this notion they were alſo conducted by analogy, for the moon became an example and authority for thoſe who taught the ſpherical form of the earth.

It is commonly believed that this knowledge might ariſe in maritime countries, where it was natural to obſerve the ſucceſſive diſappearance of different parts of a ſhip ſailing out to ſea. But the diſcovery of the round form of the earth is doubtleſs anterior to the invention of ſhips, at leaſt of thoſe large enough to be perceived at a great diſtance. Beſides, for ſuch an argument, and ſuch rude times, the concluſion appears to us too ſubtle. The obſervation in queſtion may ſerve at preſent to prove the globular figure of the earth, without having firſt ſerved to render it obſervable. Beſides, the progreſs of the human mind is often devious, leaving for a long time a ſimple idea which is on its way, to ſeize others more ſubtle and remote.

Another obſervation ſhewed the roundneſs of the earth, that of the new ſtars, which became viſible to thoſe who changed their latitude, in proceeding from north to ſouth, or the contrary. But we ſuſpect that voyages have only confirmed this opinion, becauſe that men, attached to their homes, to their herds and the culture of their fields, muſt have long exiſted before they proceeded to any great diſtance. They only left their country to fight, and only fought with their neighbours. It was neceſſary that commerce ſhould open ſome intercourſe, that war ſhould make a wider range, and above all that philoſophers and obſervers ſhould navigate, for merchants and warriors ſeldom conſider the ſtars. Philoſophers muſt have obſerved, that on proceeding towards the ſouth, the ſtars before unknown aroſe on the horizon, while on their return they diſappeared. The ſight of theſe ſtars was therefore connected with a certain poſition on the globe; and the convexity and roundneſs of the earth could alone produce this effect.

§ 7. Aſtronomy, by poſſeſſing ſome juſt notions of the ſyſtem of the world, began to become a ſcience. An idea of the motions of the celeſtial bodies began to be eſtabliſhed. Before, it had only been a ſubject of curioſity, but was ſoon to be applied to uſeful objects; and the progreſs became more rapid as intereſt is more active than curioſity. One of the firſt wants of naſcent ſociety, is a meaſure of time. Men firſt reckoned by days; and ſome ſavages of America ſtill count by ſuns. We have proofs that the Chaldeans computed in this manner, and that they preſerved this practice, even after the conqueſt by Alexander, that is long after the eſtabliſhment of years of three hundred and ſixty-five days. The obſervations which they made were engraved on bricks; and it may be believed that there was one for

each day, and that the time was calculated by the number of the bricks. But this manner of reckoning was not found convenient in daily practice, because the days in a short time became too numerous. A longer period was wished; and the motion of the moon with regard to the stars offered one of about twenty-eight days, while the phases of that planet indicated a subdivision in four parts, or weeks of seven days. Goguet thinks that they were the first measure of time, but it is evident that they are only subdivisions, and of an invention posterior to the observance of the lunar revolutions. Yet as the motion of the moon with regard to the stars, demanded observations, in common practice the return of the phases was preferred; and upon the motion of this planet with regard to the sun, months of thirty days were established.

The Neomenia, or the feast which is celebrated among almost all nations at the time of the new moon, is a proof that they are attentive to the return of that planet; and they have added festivals from different motives, in order that the observations should not be neglected. When the motion of the sun became known, it was seen that there was a far longer interval between the moment when a star disengages itself in the morning from the solar beams, till the moment when, after being again merged in them, it begins to re-appear. This interval was called the revolution of the sun; and men began to reckon by years.*

Many nations have long preserved the practice of beginning their year at the rising or setting of some brilliant star, as Sirius or the Pleiades. But as the motion of the sun was not measured as soon as it was perceived, an approximation only was demanded. This was accomplished by the reunion of twelve lunations, which elapsed in a revolution of the sun to compose a lunar year. Although the months had been at first of thirty days this year was only of three hundred and fifty-four days, because they did not delay to rectify, by the observation of the Neomenia, the too great length of the months; and they were alternately estimated at twenty-nine and thirty days to complete the revolution of the moon, which employs about twenty-nine days and a half. This year long existed among nations, whose mode of life did not permit the acquisition of more exact knowledge; and it is sufficient for the occasions of those who, like the ancient Arabs and Tatars, only live on the flesh and milk of animals; nay the wandering Arabs and Tatars still follow this usage. In fact this form of the year is very convenient for people in that state of society; the observation of the moon, which is very visible and easy, dispensing them from any necessity of a calendar.

§ 8. In the commencement of society there were only hunters and shepherds, but when the increase in number rendered it difficult to procure food, recourse was necessarily had to agriculture. It then became indispensable to know and foresee the return of the seasons; and agriculture enforced astronomical observations. It was remarked that the vegetation of plants and trees, the maturity of fruits and grains, depended upon the action or upon the presence, more or less prolonged, of the sun upon the horizon. At the time that the days became equal to the nights, the verdure re-appeared, and in consequence the culture of the soil ought to precede that epoch. When the days are the longest it is the season of harvests, which are performed successively till the nights become equal to the days. This season is that of labour and sowing of seeds, till the lengthened nights bring back the time of inaction and repose for man and nature.

These intervals were distinguished and called *seasons*. At the same time doubtless the year of three hundred and sixty days was established; and as it had been remarked that during the course of the year and the seasons, new stars daily emerged in the morning from the rays of the sun, the most brilliant were chosen as being those the most easily perceivable in the dawn, and they were regarded as signals, which indicated the time and season proper for each agricultural labour. It only remained to connect the agronomical observations with those of the heavens; and thus the first farmers were necessarily astronomers. When the most proper stars had been chosen for the different indications, each watched on his side to seize the moment of their appearance. It was not till a long time after, when individuals in a more numerous society, had divided their occupations, that there were men particularly charged with this office, who from a tower, as in Chaldea, observed the stars which appeared on the horizon, and, as in Egypt, announced them to the people by hieroglyphical signs.

§ 9. The year of three hundred and sixty days could not have been long established, for in less than thirty-five years the order of the seasons would have been absolutely reversed, and winter would have fallen into the months of the original summer. The first expedient must have been intercalary months, but it was afterwards thought necessary to study more minutely the revolution of the sun, which might be done by different means, by the return of the heliacal rising of the same star, or by the time when the sun returns to the same meridian height, which is marked by the gnomon; or, rather, as Goguet conjectures with much verisimilitude, by the points of the horizon where the sun rises and sets. "It appears to me probable," says he, "that the length of the year may have been at first determined by the observation of the rising and setting of the sun, at certain points of the visible horizon. Men in an early stage of society pass a great part of their life in the fields; and about the time of the equinoxes may have remarked a particular tree, rock, or hill, behind which they saw the sun on such a day of such a month. On the morrow they must have seen that star rise or set pretty

* When a star appears in the morning towards the east, an instant before the rising of the sun, or in the evening to the west an instant after sun-set, it is said to rise or set *heliacally*. These heliacal risings and settings regulated the labours of agriculture, and the ancients were of course attentive to their observation. This phenomenon is intended when we speak of the rising and setting of the stars.

pretty far from the same spot, because, at the equinoctial season, the declination of the sun sensibly changes from day to day. Six months afterwards they must have seen the sun return to the same point, and, in like manner, at the end of twelve months. This manner of estimating the year is pretty exact, and at the same time very simple. Any person may make the same observation, but, I confess, that I find no trace of it in history." Rudbeck informs us, that the ancient Swedes regulated in this manner the length of their year: and Goguet appears not to have known a passage of Simplicius, who says expressly that it was by observing the different points of the horizon, where the sun sets in summer and in winter, that his motion was estimated. Nor has Goguet perceived the fertility of this idea, for it explains how men might have divided the year into four equal parts, without having recourse to the observation of solstices and of equinoxes, by the meridian height of the sun, a method which must for a long time have been beyond the extent of their knowledge; and it also well explains why some nations have had years of three and of six months, of which it would otherwise have been difficult to fix the term and the duration. From Censorinus it even appears that the Carians and Acarnanians counted their year from one solstice to another; for alternately the days increased during one year, and during that following were on the decrease.

§ 10. In adopting the revolution of the sun for the measure of time, the necessity of subdivisions occasioned the preservation of the two other measures, the months and the days, but these subdivisions were not exact. The true length of the solar year is about three hundred and sixty-five days and a quarter; and it includes more than twelve, and less than thirteen revolutions of the moon. Some one imagined he would find an interval of time, which would include a number of complete revolutions of both; and this interval of time having expired, it must happen that the revolutions began together, the aspects became the same; and successively in the same order. This period was computed either by the tedious method of observations, or by calculations of the motions of these stars, but the last plan was subject to errors. Hence arose different periods, sometimes defective, sometimes better calculated, according to the more or less exact knowledge of these motions.

§ 11. As soon as there were in a nation men devoted to astronomy, either by the motive of being useful to their fellow citizens, in announcing the appearance of the stars, or by laudable curiosity, then astronomy was introduced, and began to become an art; while their meditations might produce some fruit because they were founded on facts. In examining with more attention the daily motion of all the stars, it was observed that the point of their greatest elevations divided into two equal parts the interval between their rising and setting. It was discovered that the points of the greatest elevation of each of these stars were in a circle perpendicular to the horizon, passing through the zenith and the pole of the world. The sun himself was also there at the time of his greatest height, being the middle of his course and of the day. This circle, merely fictitious, was called the *Meridian*.

§ 12. The greatest altitude of the stars is always the same; but this is not the case with the planets, and above all, the sun, whose elevation being higher in summer, and lower in winter, must have been soon observed. It was proper to study the variations of these altitudes of the sun, and to mark the differences, but astronomy had not as yet imagined the means. A man of talents found it by the simple observation of the shadow, which the sun projects behind the bodies which he enlightens. He observed that this shadow, becoming shorter in proportion as the sun was elevated, was proper to mark the progress of that elevation; and he produced a revolution in the science by the invention of the most simple, and the first of all astronomical instruments, the gnomon. The unknown inventor rendered two great services to astronomy, the first by the invention of an instrument which afforded more exact observations; the second by a method which required a series of observations on which is established their practice. He doubtless ordered a column to be constructed, or a high pillar; that the shadow might be larger, and the variations the more perceivable. He taught that every day the shortest shade should be marked and measured; and that a series of these observations would disclose the motion of the sun from the horizon to the pole. This motion, from low to high, and from high to low, was stopped and changed twice in the year. These changes were called *conversions*, *tropics*; and the points where the sun stopped before altering his course *solstices*. These objects were to become the study of successive ages.

§ 13. The first idea which presented itself, in explanation of this diversity of the heights of the sun, was that this star, besides a particular motion from west to east, had another which bore it from low to high, and from high to low, sometimes approaching, sometimes leaving the pole. A similar variation still more sensible had been perceived in the altitudes of the moon. Yet the admission of these two motions presented some difficulty to the ancient philosophers, who had their prejudices as we have ours, and who by chance, as has also happened more than once among the moderns, drew very just conclusions from a false supposition. The daily motion from east to west is uniform, and visibly in circles; and it was thence concluded, that motion in a circular line, and uniformity, were fundamental laws of nature. Not that motions in a right line had not been observed; but they were far from the sublime idea of reducing both to the same principles. The celestial motions formed a separate class, as having something divine in their circular and uniform march. This progress appeared to the ancients worthy of the simplicity of the first cause; for all studious and enlightened nations, whatever be their religious and metaphysical ideas, or their opinions on a productive cause, whether intelligent

ligent or only active, have been led to believe that this cause, infinitely wise, or infinitely powerful, did not act but by the most uniform and least complicated means, joining to the magnificence of the work the simplicity of the execution.

Now the motion with regard to the poles deranged all these ideas. In the *first* place, the supposition of a body obeying two motions at the same time, was not simple; and how conceive that these two motions did not injure each other? *Secondly*, the motion with regard to the poles was not circular, or, at least, the sun stopped at a certain distance from the pole; to return to his former path, and this march is not uniform. The ancients, without knowing the laws of motion, saw that motion could not be stopped and changed into a contrary motion, without a constraining cause. Thus the Greek philosophers, systematic to excess, and always desirous of reasoning and of explaining what they did not exactly know, imagined that the air was more thick and more dense about the poles, and that the sun not being able to penetrate was obliged to return! In Chaldea and in Egypt they were not so eager to discover causes, but, in appearance, effects were better studied. In fine, genius or chance, and perhaps both together, discovered the explanation so long time desired. It was observed, that by inclining the route of the sun with regard to the poles, all the appearances might be explained, and that the sun would only have a circular and uniform motion. The circle which he thus describes in his oblique course was afterwards called the *ecliptic*. This simplification satisfied the ancients, who had been embarrassed by the two motions, lent at the same time to the sun and to the moon. This discovery was celebrated as it deserved. In speaking of Anaximander, to whom the Greeks, so new in the world, dared to ascribe this discovery, Pliny says that he had opened the career of astronomy. In effect, this knowledge is the foundation of all the rest, and the first necessary step in the science.

Afterwards many objects of research presented themselves to the mind. The diurnal circle was observed which the sun describes at the two seasons of the year, when the days are equal to the nights. This circle was called the *equator*, either on account of that equality of the days and the nights, or from the knowledge that all the stars and planets placed in that circle remained on the horizon precisely the half of a diurnal revolution, that is twelve hours. The points where the equator intersects the route of the sun retained the name of *equinoxes*.

The equator was therefore the second circle of the sphere. The ancients thus familiarized themselves with imagining fictitious circles in the firmament; but it was difficult that the eyes should follow the imagination in fixing their position. This object was attained by a happy invention, that of large circles of copper, exactly arranged according to those imagined in the heavens. It was perceived that when these circles should be exactly directed and firmly fixed, it would be easy to mark the stars which were upon the equator, or above, or beneath, and at every moment those that passed the meridian. It is only necessary to direct the visual ray along the surface of one of these circles, and to prolong it to the firmament. There was therefore raised, perpendicular to the horizon, from south to north, a circle which was called the meridian, as it was in the direction of the celestial meridian. Another was applied at right angles, which was called the equator. The greatest difficulty was to adapt this instrument precisely, that is to say, to place the verticle circle of copper in the exact direction of the celestial meridian. But as all the ancients had observed that this circle marked the spot where the stars attained their greatest altitude, it was easy to follow some beautiful star, and to fix the instrument to the place and moment where it stopped its elevation. This method is not very exact; but such as it is we believe that it may have been sufficient in the early state of astronomy, and might still produce many discoveries. Yet we have reason to think that use may have have been made of a better and surer method, that of equal altitudes before and after noon; for the ancients certainly knew that, at equal distances from both sides of the meridian, the altitudes of the same star are equal. Having fixed, some time before noon, the length and direction of the shadow, they waited till the sun passed the meridian, and the shadow had returned to the same length; then a line of direction was drawn of this shadow, which forms an angle with the direction of the first; and the line which divides this angle into two equal parts is in the precise direction of the meridian. It is the more likely that the ancients might use this method, as according to the testimony of Gentil, who resided long in India, the Hindoos have preserved it, and still make use of it in placing their temples and pyramids.

§ 14. This instrument enabled astronomers to make an infinite number of observations. On the meridian was marked the point to which the sun ascends at the summer solstice, and also that to which he descends at the winter solstice; the interval between these two points measuring the motion of the sun with regard to the poles. This interval was found to consist of eight parts of a circle, divided into sixty parts according to the practice of the time; and as the equator equally divides that interval, the obliquity of the route of the sun with regard to that circle was of four parts, or the fifteenth part of a circle, in short, twenty-four of our degrees. This instrument by its equator divided the firmament into two hemispheres, and served to distinguish the stars into northern or southern with regard to the fixed circle to which they were referred. Names had already been given to the most beautiful stars; but when it was necessary to determine the portions of the firmament, and of the stars, among which lay the path of the sun, there was as much embarrassment as for the meridian and equator. Recourse was had to the same expedient, that of adding to the instrument a new circle placed in the direction of the ecliptic; but this circle could not be fixed, because the diurnal motion was accomplished

complished around the poles of the equator, the ecliptic changing its position every moment with regard to the horizon and the meridian. It was therefore necessary to make some changes in the instrument. The meridian was left fixed; but there was added to the equator a new circle, which formed with it the same angle as the ecliptic; and by the poles, and the points of the equinoxes and solstices, two other great circles were raised, which were called the *colures* of the equinoxes and solstices. These four circles, re-united and fixed in the meridian, were rendered moveable around an axis directed through the two poles of the world. Such was the first model of the *armillary sphere*, and of the *armillas* of Alexandria. Whether this sphere, executed on large dimensions, were made in imitation of a smaller and portable sphere, such as those of Atlas and Chiron; or, on the contrary, this portable sphere were constructed after the other, which was confined to observatories, it is certain that one or other of these spheres is of the highest antiquity.

Such, if we believe the Chinese annals, was the progress which astronomy had made two thousand seven hundred years before the Christian epoch, and, in Egypt, more than three thousand years before that epoch, if we believe the conjectures and calculations which I have made in the preceding book.

§ 15. In proportion as the instruments were perfected, their uses increased. This new sphere offered a great number; but it was necessary to establish a correspondence between the sphere of brass and the celestial sphere, and to assign the points of connection. It was first necessary to fix the equinoctial and solstitial points, which, I imagine, might be done in this manner. At the time of the longest nights, the day of the winter solstice, at the moment of sun-set, the point of winter solstice on the instrument was brought to the point of the horizon, where the sun set, and the stars were observed which were at the distance of a hundred and eighty degrees, and, in consequence, corresponded with the summer solstice. Besides, as the stars are not visible to the naked eye till some time after the setting of the sun, and as it was not possible to direct the instrument towards an unseen star, another expedient was devised, and the moon was used for an intermediate observation. Having directed this point of the winter solstice to the spot of the horizon where the sun set, they must have remarked to what point of the ecliptic the moon then answered; thus immediately after sun-set, when the stars had begun to appear, the point thus marked would be anew directed to the moon, and at the same instant must have been observed to what stars corresponded the summer solstice, and the spring equinox, then upon the horizon. It was at the same time determined to what points of the equator the most beautiful stars answered, to serve as indications when they wished to know the positions of the other stars, and of the two points of the winter solstice and autumnal equinox. These points give a natural division of the year into four parts or seasons. There were also joined the different terms of the year indicated by the rising and setting of the stars; or, to speak with more exactness, these different terms were connected with the points of the equinoxes, or of the solstices which were regarded as fixed. It was said, Sirius rises four days after the summer solstice; the Pleiades rise on the very day of the equinox, &c. Observations on the rising and setting of the stars were multiplied; and *calendars* were composed, which served to regulate the labours of agriculture.

§ 16. When the ecliptic or route of the sun became known, it was perceived that the moon and the other planets followed nearly the same course, only leaving it a few degrees above or beneath. In consequence, a zone of sixteen degrees was imagined, of which the ecliptic occupied the middle, and which was called the *zodiac*. The motion of the moon offered an easy mean of dividing it into parts; and this division seems to have been the first, because one may easily follow the progress of the moon; and, in marking every night the stars with which this planet corresponds, the zodiac was found divided into twenty-seven parts and one-third, whence some have formed twenty seven *constellations*, others twenty-eight. The sun cannot be thus followed in his course through the stars, nor can it be perceived that he has changed his situation, except from the stars which emerge from his beams in the morning, or those which immerge into them in the evening. These phenomena, whence the circumstances of the course of the sun have been deduced, have demanded combinations and meditations; while the naked eye, without the assistance of any instrument, was sufficient to observe the motions of the moon, and the divisions of the zodiac arising from that motion. When the revolution of the sun and the length of the year were known, the twelve months offered a new division of the zodiac into twelve parts.

It had already been divided into four by the solstices and the equinoxes, so no more was necessary than to divide, by means of the instruments, the intervals into three parts, which were called *signs*. This method of dividing the zodiac appears far more natural, and it is surely more precise than that which Sextus Empiricus, and Macrobius have described. But it is not impossible that their method, by the fall of water, should have belonged to a more ancient astronomy not possessed of more exact methods.

A figure was drawn which comprehended all the stars in each sign. This figure and the stars thus re-united, were called a *constellation*. Though these figures were at first only lines drawn from one star to another, when names were to be imposed, they were those of animals, whence the zone which comprises them derived its name of *zodiac*, from a Greek word signifying an animal. It may be concluded from this etymology, that these signs, which are now designed by figures of men or other objects, are posterior changes or inventions. The twelve signs were originally all marked by animals, and probably the same which still designate in Asia the years of the period of twelve years; a period which, in all that part of the world, is of the highest antiquity.

The

The idea of drawing figures, in order to class the stars, was extended to the rest of the firmament, which was peopled with animals and different figures; but we believe that men were not placed there till astrology pretended that their destiny was written in heaven; and it appeared natural to place man in the greater part of the celestial regions, which was supposed to have so much empire over him. Besides, astrology wished to mark, by the attributes and by the attitude of the men there drawn, the influence which such or such a constellation might effuse, and the inclinations with which it might inspire individuals at their birth. These figures of men were at first nameless; and it was in more modern times that the vanity of the Greeks imagined the apotheosis of their heroes in the firmament, and the consecration in that eternal book of their names to posterity.

§ 17. The method of indicating the time of the equinoxes and of the solstices, by the rising or setting of some beautiful star, led to an important discovery. The times of the equinoxes and the solstices were still observed, either by certain known points of the horizon where the sun there rose and set, or by the length of the shadow at noon. The ancients had connected these different remarks, having observed, for example, that at the rising of some beautiful star, announcing the summer solstice, the sun must arise at such a point of the horizon, and that the shadow at noon ought to have a certain determined length. In assidnously repeating these observations every year, it was perceived after some ages that they no longer coincided. When the star appeared, the sun did not rise to the same point, and the length of the shadow exceeded the former measure. This last character belongs so visibly to the solstice, that they were forced to conclude that the star had changed its place in the firmament. The ecliptic circle of copper in divisions, and the sphere which we have described, proved the means of evidencing this discovery. They had been used to fix in the starry heavens the spots of the equinoctial and solstitial points. It was perceived that the stars no longer answered to the same points of this circle, and that they seemed slowly to advance along the ecliptic. But as this motion was general and the same for all the stars, and as they preserved the same order and the same configurations among themselves, so much uniformity could not be the effect of particular motions; and this general and uniform motion seemed to belong to the firmament itself where the stars were fixed. The ancients thus imagined a sphere, under the name of *Primum Mobile*, which, besides the daily motion which conducts the stars from east to west, had another contrary and very slow motion from the west towards the east.

§ 18. The knowledge of the four points of the equinoxes and solstices gave room to remark that the sun did not perform an equal course during the four intervals. The star which regulates the seasons, the father of nature, and the sovereign of the firmament, was therefore unequal in his progress! This circumstance did not deprive him of his divinity, and he nevertheless preserved the intelligence which presided over his course. The ancients, more curious in facts than in explanations, do not seem to have enquired the cause of this inequality, nor the manner of reconciling it with the uniformity of circular motions, which they regarded as a general constant principle. Submissive to evidence, though attached to the ideas of their ancestors, they preserved prejudices because they were old, but admired the truth when it was demonstrated. This discovery was confirmed by a like inequality in the return of the phases of the moon. Particular attention had always been paid to these phases, as well for the measure of time and the celebration of the periodical festivals, as in the superstitious fear of *eclipses*, which had for a long time fixed the attention of mankind. We are here forced to return in order to resume the chain of ideas.

Eclipses, above all eclipses of the sun, at first occasioned great terror. The loss of light seemed to threaten the extinction of nature; and if we be entitled to blame the nations, still tormented with these fears as ignorant or stupid, it would be unjust not to grant that the first eclipses must have produced a terrible impression. They must have been often repeated before men could be convinced that they had no dreadful consequences; and that they showed in their return an order, a succession which ranked them in the number of natural phenomena. The Chaldeans, who watched without ceasing in the study of the heavens, and whose astronomers relieved each other successively like centinels, must have permitted few eclipses to pass without observation. The first object of enquiry was the cause; and that of the eclipses of the sun must have been the first discovered. As soon as this phenomenon was understood to have a natural and regular cause, it was easy to comprehend that an opake body alone could thus intercept the rays of the sun. As it was known that the moon was an opake body, having no light except what she received from the sun; as the moon had been seen to approach that star, and to lose herself in his beams a short time before the eclipse, and disengage herself from them soon after; it was natural to conclude that the moon was the obstacle which deprived us of the light of the sun in whole or in part. But what was the body which deprived the moon herself of her light, and eclipsed her when opposite to the sun, she was in her greatest splendour? The effect of the same cause was acknowledged, the passage of an opake body, which, by degrees, precluded her light, restored to her after a longer or shorter interval. Some nations even imagined globes expressly made for the purpose of eclipsing the sun and the moon; but a few reflections upon an effect which may be daily perceived, discovered the cause. Every enlightened body throwing a shade behind it, the shadow of the earth ought, in consequence, to be directed opposite to the sun; and as the moon turns around the earth, she must be eclipsed in plunging into that shadow, which deprives her of the light of the sun. Thus the cause of the eclipses both of the sun and moon became known. The observation

vation of the eclipses of the moon, and the knowledge of their causes, confirmed a discovery already made. It was observed that the shadow of the earth, visible on the enlightened disk of the moon, was round; and this observation shewed that there was no deceit in the supposition that the earth was spherical. But why should the moon, which passes every month between the sun and the earth, is every month opposite to the sun and in the neighbourhood of the shadow of the earth, not occasion every month an eclipse of the sun, and suffer herself an eclipse? This question was natural, and must have presented itself at the first, but offered a difficulty, which, perhaps, occasioned some hesitation concerning the explanation of the doctrine of eclipses already mentioned. The solution was not obtained till the latitude of the moon, or its distance from the ecliptic, had been discovered.

§ 19. This planet describes a circle inclined to the ecliptic; and she wanders sometimes a little more than five degrees either to the north or to the south of that circle. As her course is inclined, it follows that it must intersect the ecliptic at two points, these two points of the orbit of the moon were called the *nodi*, *nodes*, or *knots*; and it was perceived that the eclipses did not happen except when the moon was in these intersections, or, at least, when she was not far distant The course of the sun received in consequence the name of ecliptic. At this period seems to have been demonstrated the necessity of the fixed and armillary sphere, which we supposed to have been invented before. For it may be asked, how could the ancients perceive that the moon wandered from the ecliptic, if they had not had a circle of copper always placed in the direction of that celestial circle, and to which they might refer the position of the moon in the heavens? How otherwise could they have discovered that eclipses did not happen, except near the intersections of the orbit of the moon and the ecliptic, or in these intersections themselves?

§ 20. When it was known that eclipses were natural phenomena, often revolving in the same year, curiosity was displayed in the observation, and in perserving their memory in order to discover the rule of their return. Nor was more minute attention wanting on the time of the day or night that they happened, and the part of the moon eclipsed. Sometimes when the eclipse was not total, the extent of the part eclipsed was compared with the whole. The new and full moon was sedulously observed that no eclipse might escape notice; and it was by the observation of these phases that the first knowledge was obtained of the revolution of the moon with regard to the sun.

§ 21. The ancients arrived at a more exact knowledge of that revolution, in measuring daily upon their ecliptic the distance of the sun from the moon. These first decisions were no doubt infected with great errors; but as they accumulated, the errors were divided through a larger number, and the determination became more exact. In continuing these observations, with a constancy only to be found among orientals, they perceived that the revolutions of the moon were sometimes more long, and sometimes more short; and that even the interval between the conjunction and opposition was scarcely ever equal to half a revolution.

They determined the period of this inequality. Whatever was their method, it no doubt enabled them to determine with more facility the time when this inequality was the greatest. Hence the time when this greatest inequality returned a second time indicated the duration of that period. They also remarked that eclipses did not happen at the same points of the ecliptic; and it necessarily followed that these points or the nodes had changed their places. These nodes therefore had a motion, and in consequence the period of the return of the moon to one of these nodes was not the same as that of the return of the moon to a given point of the zodiac. The ancients knew this period which they called the revolution of latitude; as they had known that of the inequality by their constancy in the study of the heavens. A long train of observations enabled them to find grand periods, in which the moon made a number of entire revolutions relative to its inequality, the nodes, and the sun. They proceeded even so far as to bring back the moon to the same point of the zodiac, or at least to determine the number for a complete revolution, and how many degrees were wanting that she might attain, at the end of the period, the point of the zodiac when she started at its beginning; an object which the ancient astronomers could not have obtained, if they had not had the divided ecliptical circle, of which we have already supposed them in possession, and to which they might refer the daily motion of the moon. The wide interval of these observations, and the length of these periods, gave with much exactness the length of each revolution; and it follows that the moon, was of all the planets, that of which they best knew the motion, while in modern ages it was for a long time that of which the motion was the least known. Its theory was the most easy to sketch, because its motions are rapid, but it is more difficult to examine profoundly, because the variations and the inequalities are more considerable and more multiplied.

§ 22. Among these periods some were found which bore back the eclipses of the moon, of the same extent, to the same points of the firmament, and the same days of the year; and such periods were used to foretel these eclipses. As to the eclipses of the sun, irregularities were remarked which led to a despair of regulating them by any constant rule, nor was a period observed which could reduce them to the same days. This was the effect of the parallax, which remained unknown for a long time after. It would even appear that the observation of those eclipses was abandoned; for among the eclipses observed by the Chaldeans, which Ptolemy has transmitted to us, there is not one eclipse of the sun. This is a loss which we would the more regret, if a greater number of both had reached us. The cause of this loss was the prejudice, that these phenomena did not follow any certain rule, whence it was concluded that the

the obſervation was aſeleſs; and this may convince us, that in the ſtudy of the heavens, and of nature in general, we ought not to reject any obſervation nor any experience, for the time may arrive when they will be found uſeful, and we ſhall have planted for poſterity.

§ 23. As to the other planets, their leſs remarkable appearance and leſs ſenſible motion muſt have excited later attention. The moſt brilliant, Jupiter and Mars, were without doubt the firſt obſerved. Their courſe was followed, and it was ſoon perceived that there was a time of the year when their motion ſlackened, then entirely ſtopped, and in fine became retrograde; till, ſlackening and ſtopping a ſecond time, it again became direct. By direct motion is here implied that which is performed from weſt to eaſt, or in the ſame direction of that of the ſun and moon, while the retrograde motion is the contrary. The ancients, ſeeing that theſe ſtrange appearances were periodical and annual, employed themſelves in the obſervation, waiting till more intelligence ſhould be able to explain them. They carefully marked the moment at which theſe planets yearly became ſtationary, and the period of their motion whether direct or retrograde. Theſe obſervations, though inaccurate, were uſeful in the end. The apparitions of planets appeared to the ancients equally worthy of obſervation. They underſtood by the time of apparitions, that in which the planets diſengaged themſelves from the rays of the ſun, and became viſible in the morning a little before day-break. In ſpeaking of the ſtars, this is called the heliacal riſing. The aſſiduous obſervation of the riſing of the ſtars ought naturally to have led to that of the apparition of the planets; and it was remarked that theſe apparitions, like the riſings of the ſtars, did not happen at the ſame periods of the year, and that the phenomena of ſtations and retrogradations did not happen in the ſame ſign, but ſucceſſively in the different ſigns of the zodiac. In fact, only a few months were required to evince that Mars changed his place in the firmament, and did not correſpond with the ſame ſign of the zodiac. Jupiter alſo was every year in a new ſign; while Saturn, whoſe motion is more ſlow, prevades the ſame ſpace in two or three years. Two motions, or two revolutions, were therefore recognized in each of the planets, one with regard to the ſun, the other with regard to the zodiac. The planet Jupiter, for example, performs his revolution with regard to the ſun in about thirteen months, that is to ſay that thirteen months elapſe between one apparition and another, while his revolution with regard to the zodiac is not completed in leſs than eleven years and ten months. The ancients in like manner perceived that Mars employed little more than two years, and Saturn ſomewhat more than twenty-nine years, in prevading the entire zodiac.

§ 24. Saturn is the leaſt brilliant of all the planets. He moves the moſt ſlowly, and appears in conſequence to have the greateſt circle to run, whence he was judged more diſtant than all the reſt. Next were placed Jupiter, Mars, the ſun and the moon, each according to the degree of their ſwiftneſs, all theſe planets deſcribing circles around the earth. Such was the ſyſtem of the ancients, more known under the name of Ptolemaic. But the two other planets, Venus and Mercury, threw embarraſſment and uncertainty into this arrangement. They were ſometimes ſeen to precede the ſun, and ſhew themſelves in the morning before he aroſe, or to follow him and ſhine in the evening after he ſet. They were however ſeen to correſpond ſucceſſively with different ſigns, and different degrees of the zodiac, and not return to the ſame points till about the end of a year. Theſe planets were therefore ſimilar to the three others; and had, like them, two motions: one with regard to the zodiac, which was accompliſhed preciſely in the time of a revolution of the ſun or of a year, the other with regard to the ſun itſelf. They had their ſtations and retrogradations. But the queſtion was, to aſſign to theſe planets their proper place in the ſyſtem of the world, and to know if they were nearer or further from the ſun than the earth. The rule which had been followed for the three others here failed, becauſe theſe two planets ſeemed to have the ſame ſwiftneſs with the ſun in the zodiac, and it was only certain that they were more diſtant than the moon. This queſtion was ſo difficult to reſolve that debates aroſe. Some placed them above the ſun, others beneath. Nevertheleſs it was obſerved that the ſplendour of Venus, ſometimes ſeen on the right of ſun, ſometimes on the left, was ſubject to ſome variations, and there were times, when, although viſible, equally diſtant from that ſtar, and equally emerged from his beams, ſhe was much leſs brilliant. The example of Saturn, whoſe light is more feeble and dull, becauſe his diſtance is greater, led to think that Venus, perhaps, was not always at the ſame diſtance from the earth.

It was imagined that ſhe might be ſometimes more diſtant, ſometimes nearer than the ſun. From theſe four circumſtances re-united, from ſeeing Venus and Mercury on the right and left, above and below the ſun, the two firſt being facts, and the two others very probable conjectures, they dared to conclude that the orbit of theſe two planets enveloped the ſun, and that they turned around him; we ſay that they dared to conclude, becauſe this aſſertion was very new and very bold for the time. A man of genius alone could conceive it; and, after profound meditation, infer that he had foundations to ſupport it. But this idea was not general, being on the contrary peculiar to one people, the ancient Egyptians. This juſt idea muſt however at leaſt have appeared happy, for it explained in the ſimpleſt manner the ſtations and the retrogradations. When the viſual ray forms a tangent with the circle, which theſe planets deſcribe around the ſun, their motion being no longer ſenſible, they muſt appear ſtationary; and this happens twice in each revolution. In the ſuperior part of their orbit they proceed in the ſame way with the ſun, and appear direct; while in the inferior part, their oppoſite courſe muſt appear retrograde.

§ 25. Some philoſophers proceeded ſtill further, and acknowledging that theſe two planets turned around the ſun,

ſun, they thought that he muſt alſo be the centre of the world, and ſuppoſed that all the planets and the earth itſelf moved around that glorious body. Others even imagined that the diurnal motion of the ſtars and planets was only en appearance, cauſed by a rotation of the earth around its axis. But theſe bold and merely philoſophical ideas were not ſupported by facts among the ancient nations known to us; though perhaps we may be able to ſhew that they are the veſtiges of higher antiquity, and of a ſcience brought to perfection.* In poſterior ages, if ſome hints of analogy occaſioned them to be adopted for a moment, if ſome philoſophers caught them by a kind of inſtinct in diſcovering truth, they were too contrary to appearances not to be ſpeedily rejected.

* A favourite dream of Bailly.

ON THE

PROJECTION OF MAPS.

BY M. LACROIX.

THE introduction of M. Lacroix to the French tranſlation of this work, is juſtly regarded as the moſt maſterly which has yet appeared. It is judiciouſly confined to ſuch topics of aſtronomy as are ſtrictly connected with geography; and they are preſented in a clear and popular form. The projection of maps being one of the moſt important provinces of the ſcience, it was thought adviſeable to tranſlate that portion for the benefit of the Engliſh reader.

§ 56. The difficulty of executing globes large enough to ſhew the details of geography, and the embarraſſment occaſioned by their uſe, even while the dimenſions can afford little information, have taught the neceſſity of repreſenting on a plane ſurface the reſpective ſituation of different objects on the globe of the earth.

Curved ſurfaces, as compared to plane, are divided into two claſſes; ſome, like thoſe of cones and cylinders, being capable of extenſion on a plane, without rent or fold, whence they are called developable ſurfaces; while others, like thoſe of a ſphere and ſpheroids, are quite incapable of this extenſion. If the earth had been comprised in the firſt claſs, a ſimple developement, of eaſy execution, would have preſented maps, in which the diſtances of the places, and the reſpective extent of the countries, would have been preſerved, ſuch as they are in nature: but unhappily the earth is a ſpheroid, and its ſurface can never exactly coincide with a plane; whence ariſes the impoſſibility of preſerving at the ſame time, on a map, the natural relations between the extent of the countries, the diſtances of places, and the ſtrict reſemblance of configuration. We are therefore obliged to have recourſe to different conſtructions, in order to repreſent, at leaſt in an approximate manner, each of theſe relations.

Theſe contructions have been called *projections*; a name applied in general to drawings, of which the object is to repreſent, on a plane ſurface, the dimenſions of ſpace and bodies. They are of two ſorts, ſome being perſpective repreſentations of the globe, or parts of its ſurface taken from different points of view, and upon different planes conſidered as pictures; while the others are only kinds of developments, ſubject to the laws of approximation, and confined to the relations which are intended to be preſerved. To this latter kind belong the large map of France, and the ſea charts in daily uſe.

Lambert, and after him Euler and Lagrange, have reduced the theory of theſe two kinds of projections to the general principle of the tranſformation of circular co-ordinates*, aſſumed from the ſphere, namely, meridians and parallels, into other ſtrait or curved lines traced on a plane, and depending upon conditions relative to the deſired qualities of the map.

§ 57 The choice of the point of view, and of the plane of the picture, being made the projection, may be conſtructed for each particular object, according to the rules of common perſpective, here reduced to determine on the picture the point from which the viſual ray ſhall reach the object; but the number of operations which muſt be made, if each point of the country meant to be repreſented were conſidered ſeparately, being too conſiderable, it is thought ſufficient to conſtruct the lines which are the perſpectives of the meri-

* Things arranged and dependant on the ſame order.

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dians and parallels, and which, by their junctions, determine all the geographical positions.

Setting aside the oblate form of our globe, and considering it as a spherical, it may be perceived that the whole of the visual rays, extended to all the points of any circle formed on the globe, constitute a cone, of which the section, in the plane of the picture, can only be one of the curves of the second degree, and even in somecases a strait line. It would appear that the first decisions, in the choice of the point of view, were dictated by the consideration of the consequent facility in the construction of the map: and that, from the time of Ptolemy, it had been observed that in making the plane or picture pass by the centre of the sphere, and placing the point of view at the extremity of the radius, drawn perpendicularly on that plane, all these circles of the globe were represented by other circles, of which the construction was easy, and which intersected each other in the map, under the same angles as upon the sphere, so that the spherical rectangular quadrilaterals, comprehended between the meridians and the parallels, were represented by curvilinear quadrilaterals, also rectangular.* It has since been proved that the infinitely small portions of the globe assume in this projection their natural figure, but it must be observed, that this similitude only takes place in very small spaces. Such are the conventions which have given rise to the *stereographic projection*, and such are its principal properties †

It is more commonly employed to represent an entire hemisphere; and when two are joined they constitute a map of the world. When those are chosen which are circumscribed by the first meridian, the picture is in this case the plane of the meridian, and the eye is placed in the pole of that circle. It is sufficient to see a map of this kind to comprehend that the quadrilaterals, comprised between two consecutive meridians and parallels, augment in extent, in proceeding from the centre to the circumference, and that in a very considerable degree. It is perceived besides that this enlargement results from the obliquity of the visual rays, when they depart from that which is perpendicular to the picture, and which may be called the optical axis. Hence it follows that the parts towards the borders of the hemisphere have a far more considerable extent, than those towards the centre; and that mistakes will arise if they be referred to the latter.‡

Maps of the world have the further inconvenience of separating the adjacent parts of the globe, and of only offering in an exact manner the respective situation and the configuration of the countries towards the middle of the map. This defect is remedied in *Polar* and *Horizontal Projections*, the first, representing the hemispheres separated by the equator, display with sufficient exactness the regions around the poles; while the second present the hemispheres above and below the horizon of the place to which they refer, and are the most proper for the knowledge of the surrounding regions, or their antipodes, whence they merit particular attention.

§ 58. I shall therefore give the demonstration of the fundamental properties of these projections whence I shall deduce the process of their construction. The eye being supposed at O fig. 20, the plane ADBE, drawn through the centre C of the sphere, perpendicular to the radius OC, is the plane of projection. Any circle GIH, traced upon the surface of the sphere, determines the cone OGIH, of which the intersection *gib* with the plane ADBE is the projection of the proposed circle. Now the plane AFBO, drawn by the line OF, and by the centre K of the circle GIH, cutting at right angles the planes GIH and ADBE, presents the means of knowing the angles which these planes make with the sides of the cone OG and OH; and it will be seen that the angle OGH, of which the summit is at the circumference, having for measure the half of the arc OBH, is equal to the angle O*hg*, which, being placed between the centre and the circumference, has for its measure the half of the sum of the arcs HB, and AO; besides the angle O being common to the two triangles OGH and O*gh*, it follows that the angels OHG and O*gh* are equal, whence the cone OGIH is cut in an antiparallel direction by the plane ADBE, whence the section *gib* is a circle.

This last, which is the projection of the circle GIH, will be determined when we know its size, and the position of its diameter; and to obtain them it is sufficient to construct in the plane AOBF the triangle GOH, in accord with which the plane meets the cone OGIH, the line AB, which then represents the plane of projection, intersecting the triangle OGH, in the diameter *gh* of the projection required.

§ 59. This being established, in order to construct a map of the world on the plane of the first meridian, the point of view being placed in the centre of the hemisphere, opposite to that which is to be represented, will be at the intersection of the equator and meridian, which divides this last hemisphere into two equal parts. First is considered the section of the globe made by the plane of the equator ADBE, fig. 21. The line AB, the common section of that plane and of the picture on the projection, represents the equator; the points M and N mark two points of the division made on this circle by the meridians; the eye is then at D, and the visual rays MD and ND, drawn to the points of division M and N, give upon AB, at *m* and *n*, the perspectives or projections of these points; the three equal arcs AM, MN, NE are then represented by the parts A*m*, *mn*, *n*B, visibly unequal.

In drawing through the point M′ diametrically, opposite to the point M, a visual ray M′D, we shall finish the angle MDM′, formed by the two opposite sides of the cone, passing by the circumference which comprehends the meridian drawn to the point M, and its opposite,

* Ptolomæi Planisphærium, etc. Aldus Venetiis, 1558.

† The word is derived from the Greek, meaning the art of drawing the form of solids on a plane.

‡ Some geographers begin with the corners, and work towards the centre.

posite, and prolonging the strait lines AB and M'D till they meet at m', the interval mm' will be the diameter of the projection of the meridian passing through the point M.

If it be now conceived that the circle ADBE turns around the diameter AB, it may be brought on the plane of the first meridian. The line DE will then become the axis, the points E and D will be the poles, and the lines M'D, M'D, not having changed their situation with regard to AB, if there be described on mm', as diameter, an arc of a circle EmD, it will be the projection of a meridian distant from the former by an arc equal to AM.

To construct the projections of the parallels to the equator, we must consider the section of the globe made by the plane of the meridian passing through the sight, and perpendicular to the first meridian. We may still use fig. 21, and conceive that the plane of the first meridian ABDE has turned around the axis of the poles DE, to assume a situation perpendicular to its first. The point B will then be the spot occupied by the eye, the axis ED will be the projection of the middle meridian, the points M, N, taken on this meridian, will belong to the parallels, whose latitudes are AM, AN; in fine, the visual rays BM, BN, will give at r, and s, the projections of the points M and N.

In assuming the arc EN' equal to EN, is determined on the parallel a point N', diametrically opposite to the point N; and prolonging the visual ray BN' and the line DE till they meet at s' the interval ss' will be the diameter of the projection of this parallel. If, therefore, the circle ADBE be brought to the position of the first meridian in this motion around the line DE, the sight lines BN, BN', will not change their respective situations; and there may be described on ss', as a diameter, the arc NsN', which will be the projection of the parallel passing at the latitude AN.

§ 60. All this construction, which may be effected on one figure, is only intended to find the graduation of the diameter AB, which represents the equator, and that of the axis ED which is also the meridian of the middle of the map; for the points m and n combined with the poles, give three points of each meridian, and there are also three for the parallels in combining the two extremities N and N' with the point s determined on the diameter DE.

The lines Cn Cm are easily calculated in the rectilinear triangles DCn, DCm, rectangular at C, whence we know the common side CD, and the angles CDn, and CDm, measured by the halves of the arcs Ne, and ME, which are the complements of the longitude of the meridians.

The triangles BCr, and BCs, give in like manner the distances Cr and Cs which form the graduation of the meridian in the middle of the map.

§ 61. The construction of the *polar projection* consists in the determination of the degrees of the meridian, and fig. 12. indicates the operation. The circle ADBE represents a meridian upon which the eye is at D at one of the poles, and whose projection is the diameter AB; the arcs AM, MN, NE, are projected upon that line in Am, mn, nC, by the visual rays DM, DN. It may be then conceived that the plane ADBE, turning around AB, may apply itself on the equator; and from the centre C, with the radii Cn, Cm, circles are described, which are the projections of the parallels to the equator, passing by latitudes equal to the arcs AN, and AM. As to the meridians, as their planes intersect each other according to the axis of the poles, which is at the same time the optical axis, their projections are the radii CM, CN, corresponding with the longitudes AM, AN.

§ 62. In the *horizontal projection*, the circle ADBE, fig. 23, indicates the meridian of the place proposed, which divides its horizon into two equal parts. The eye being always at D, the visual rays DP, DN, DN', drawn to the superior pole P, and to the extremities N and N' of whatever parallel, mark upon AB, which is the projection of the semicircle AEB, the projection p of the pole, and the diameter nn' of the parallel. The equator is obtained in the same manner, FF' denoting its diameter, while ff' is that of its projection. This projection, and that of the parallel, may be traced in conceiving that the circle ADBE is turned around the diameter AB, to fall on the horizon; the equator being the ark EfD, and the parallel being the circle nn'.

To determine the projections of the meridians, first is sought that of the inferior pole P', which the visual ray DP' being prolonged, gives at p'. Conceiving then the circle ADBE to be applied anew on the horizon, there is described on the diameter pp', a circle which represents the projection of the meridian perpendicular to that of the place. As they must all pass through the points p, p', the projections of the meridians will have their centres in the line de perpendicular upon the middle of pp'; and to finish their determination, it is sufficient to find a third point, which may be done in many ways. That which I am about to give rests upon a construction which agrees with all similar determinations, and which consists in referring or projecting the different points of the equator upon the horizon, by right lines perpendicular to the plane of the latter.

For this purpose, I assume an arc BL, equal to the longitude of the proposed point of the equator, and lay down GL perpendicular to DE, then bring GL to CF from C to L'', and drawing L''L' parallel to DE, the point L' of the intersection of the lines L'L'' and GL is the projection required, or the foot of the perpendicular let down from the point of the equator, of which the longitude is equal to BL on the horizontal plane*.

* This process will be evident by its description alone to readers who have studied the geometry of planes and surfaces; they will perceive that the angle FCB is that which forms the plane of the equator with the horizon; and, that in consequence we have, in order to construct the points of the first, its common section DE with the second, and the angle which they comprehend. See *Compliment des Elémens de Géométrie.*

This

This being done, if we observe that the plane, passing through the sight and the proposed point of the equator, being drawn by the line CD, perpendicular to the plane of the horizon, necessarily contains the perpendicular let down from that point at L', it will be seen that its intersection with the horizontal plane is the line CL' drawn by the centre of the horizon. This right line will determine at *l* on the arc of the circle E*l*D, which is the stereographic projection of the equator, the projection of the point proposed. In repeating this construction, that of the equator may be easily graduated, conformably to the laws of the projection.

It will also be remarked, that the line CO is the projection of the circle of altitudes (§ 51) drawn through the spot which occupies the centre of the map, and by the proposed point of the equator, since the planes of the circles of altitude passing by the line DE necessarily have for projections, lines drawn by the centre C of the map.

§ 63. The inequality of the spaces of the graduation of the stereographic projection does not, in general, permit the application of a rectilinear scale to compare the respective distances of places, distances which are measured according to an arc of the great circle which joins these places two and two; but we may always, by means of the graduation itself, measure the distance between the centre of the map and any one of its points; and we may, in consequence, find upon a horizontal projection, referred to Paris, for example, the distance from this city to all the other points of the globe. This property is the consequence of a projection in which all the great circles which pass by the centre of the map, intersecting each other according to the optical axis, have for their perspectives right lines drawn by that centre, and admit a graduation similar to that which is marked upon the equator of maps of the world constructed on the plane of the meridian.

In placing the point of view at the centre of the sphere, and assuming for the picture a plane tangent to its surface, there is obtained a perspective of the globe, in which all the great circles are represented by right lines. It alters like the preceding, and still in a greater degree, the extent of the countries in proportion as they are distant from the centre of the map; nor can it even represent an entire hemisphere, because the visual rays, drawn by the circumference which terminates this hemisphere, are parallel to the plane of the picture; but it may be very useful for portions of small extent, and admits a kind of scale of which the construction is not difficult. It is doubtless for this reason that Prony proposed its use in surveying lands. This projection is further remarkable, as it is employed in making sun dials.

It will not be difficult to modify in this case the procedures which I have already given for the construction of meridional, polar, and horizontal projections. There must be drawn from the point C of the figure cited in these articles, the visual rays which determine the section made in the cones, perpendicularly to the circles, which are to be represented, and the plane must be assumed parallel to that which passes by the centre and is tangent to the circle A D B E. It will then be seen that, in the projection on the plane of the first meridian, the meridians will be strait lines, perpendicular to the equator, which will also be a right line; and the parallels to the equator will be hyperbolas. In the polar projection the meridians will be strait lines, drawn from the centre of the map, and the parallels to the equator circles having their centre at that point; in fine in the horizontal projection the meridians will be right lines drawn through the projection of the superior pole. The parallel of the place to which the projection is referred will be represented by a parabola, those which are nearer the pole by ellipses, and the others on each side of the equator by hyperbolas.

§ 64. If we conceive the point of view carried to an infinite distance from the picture, the visual rays will become parallel among themselves; and supposing them then perpendicular to the plane we shall have the *Orthographic Projection*, in which the meridians and parallels are in general represented by ellipses, excepting in the polar projection, where the meridians are right lines, and the parallels concentric circles. The whole of the visual rays, directed to the different points of the circle to be represented, then forms a cylinder, of which the axis is parallel to the line marked C O fig. 20. To form an idea of this it is sufficient to inspect fig. 24 analogous to fig. 21; the visual rays *Mm*, N *n* drawn by the different points of the circle A D B E, considered as the equator, will determine on its diameter, the graduation conformably to the laws of the projection. The space *m m'*, comprised between the two perpendiculars M *m*, M' *m'*, led from the two opposite points of the meridian, is the lesser axis of the ellipsis, which this circle has for its projection; and the great axis is the diameter of the sphere, or of the first meridian which remains circular. The parallels to the equator, having their planes perpendicular to that of the first meridian, are there represented by their diameters as N N'. After the manner in which I have modified the design of the meridional projection, it is easy to find the changes which that of the two others must undergo.

A very simple sketch will instantly display the orthographic projection of any place on the plane of the meridian, and its distance perpendicular to that plane. Having drawn upon the plane of the first meridian A D B E, by the latitude A N of the place proposed, the diameter N N' of its parallel, the circle is described, and we take the arc N L equal to the longitude, then drop upon N N' the perpendicular L *l*, the point *l* being the orthographic projection of the place, while L *l* is its distance on the plane of the meridian. The same sketch executed for another point also giving its projection, it is easy to find the right line across the globe which immediately joins these two places.

The operation is simplified when projected on the plane of the equator. There is formed the angle A C B,

B, fig. 25, equal to the difference of longitude of the places proposed; the arcs A M and B N are assumed as equal to their respective latitudes; the right lines M *m* and N *n*, perpendicular on A C and B C, give the projections *m* and *n* of these places, while *m n* is that of their distance. If then you raise on *m n* the perpendiculars *m* M″ *n* N″, respectively equal to the right lines M *m* N *n*, and draw M″ N″, this right line will be the chord of the arc of the great circle comprised within the two places proposed; and in carrying it to the meridian divided into degrees, we shall obtain, as in § 47, the measure of the shortest road from the one point to the other.

If the point N was in the hemisphere opposite to the position of the point M, it must be constructed at N′ beneath B C, its projection on the plane of the meridian being still *n*; but we must carry the perpendicular N′*n* beneath the right line *m n* and the shortest rectilinear distance from the two proposed points will then be M″N″.

§ 65. The orthographic projection has, with regard to spaces, the contrary defect from the preceding, as it diminishes them from the centre to the circumference, on account of the obliquity under which the lateral parts of the sphere are presented to its diametral plan. La Hire thence concluded, that in prolonging the optical axis out of the sphere, the plane or picture still passing by the centre, there existed on that axis a point where the inequality of spaces was the smallest possible; for it is evident, that when the point of view is at such a distance, that the obliquity of the rays which tends to enlarge the spaces, becoming smaller, may be compensated by that of the projected surfaces which tends to diminish them, and their increase must be changed into decrease. There cannot be absolute equality in all, because the law of their variation depends on their particular situation; but at the limit which we have assigned, their differences are sufficiently small to be neglected in a general map.

La Hire * has assumed the point of view of his projection, at the distance from the sphere equal to the sinus of forty-five degrees. The fig 26 shews how the graduation of the equator is obtained, when the projection is made on the plane of the meridian, placing the eye at the point *d*, such as D*d*=FG, the arc BG being the half of BE, whence C*g* is the half of BC. It might also be required to place on the line DE the point *d*, so that the degrees of the equator contiguous to the point C, or to the meridian of the middle of the map, and to the point A, or to the first meridian, should occupy the same space on the diameter AB; which is easily accomplished by means of the trigonometrical formulæ, which express the size of any space *mn*.

I do not know if maps have been constructed on this projection, and I am surprised that it should not become common, for it appears to me preferable to the common projection of maps of the world. It will be in vain objected, that the meridians and the parallels being therein represented by ellipses, it must be more difficult to trace, for it is evident that the method of the projection must always be for a skilful geographer the smallest of the difficulties presented in the execution of a map. There are numerous simple and convenient methods of drawing ellipses through points; and we are often obliged to employ them for the circular meridians and parallels, placed towards the centre of maps of the world on the stereographic projection, because their radius is too great to be described with compasses. The horizontal projection performed after the principles of La Hire, would be capable of giving distances as well as the stereographic. In fine, I cannot see that any property of the stereographic projection can recompense in planispheres the inconveniences of the disproportion thence arising between equal spaces; and the error into which a disciple would be led who wished to compare, for example, India with Novaya Zemlia, or the Red Sea with Hudson's Bay.

§ 66. The stereographic projection is little used in particular maps, and the Germans alone have introduced it, particularly Hasius who composed the greater part of the maps in the Atlas of Homann, in much request towards the middle of the last century. The four parts of the world, separately represented in this projection, are only portions of a planisphere constructed on the like dimension, on the plane of a meridian perpendicular to that which passes through the middle of the map, the eye being placed in the plane of the latter. The excessive length of the radii of the circles renders them very difficult to observe; and the alteration of the spaces and distances is not less than in other projections of more easy execution; whence these maps are little known in France.

The inequality of the spaces may, however, be diminished, as in the planisphere, by placing the point of view out of the globe; but the distance to which it must be carried, depending on the extent of country contained in the map, will diminish in proportion as this extent becomes smaller, and may be easily calculated by comparing the degree on the margins of the map with that which is in the middle.

It will be easy to persons familiar with geometry and trigonometry, to deduce from § 59 and § 62 the procedures of the calculation in order to construct these maps, and to draw the arcs of the circles which they must contain by points, in referring them to their chords or to their tangents; but these details would here pass the bounds which I have prescribed to this discourse.

§ 67. The most simple of the projections by developement, is what is called the *Conical Projection*; it being, in fact, natural to compare a spherical zone to a truncated cone, and thence to construct its developement. The parallels become circles, described from a summit of the cone taken as a centre; and the meridians are right lines subjected to pass through that point. It is visible that the result will approach the nearer, in proportion as the map shall embrace less extent

* Mem. de l'Acad. des Sc. 1701, p. 260.

tent in latitude. This projection may vary in different ways; for it may be supposed that the cone is a tangent to the middle parallel of the map, and, in consequence, exterior; or that it may be in part inscribed in the sphere, that is to say, formed by the secants of the meridians. In the first case, the map will not be perfectly exact, except on the middle parallel, which will preserve in its development the length which it really possesses on the sphere; but the parallels placed above and beneath will exceed those which on the sphere are correspondent. Murdoch, an English geometrician, has proposed to substitute to the tangent cone, a cone partly inscribed, and determined by this condition, *that the part of its area comprehended in the map, should be equivalent to that of the spherical zone which it represents.*

The whole construction of this kind of map rests on the determination of the summit of the cone, and on the amplitude which the circle serving as its base must assume in its development.

When the cone is tangent to a point E of the meridian AP, fig. 27, its side will be obtained in prolonging the tangent of that point till it shall meet the axis C P, also prolonged; the line ER, being then the side of the cone, and its basis the circle having E *e* for its radius. The development is effected by known means, for which the *Complement des Elemens de Geometrie* may be consulted.

To form the degrees of longitude, we must take the three hundred and sixtieth part of the arc, described from the summit R as the centre, with a radius RE, and which represents the development of the parallel passing by the point E, then drawing right lines through the divisions of that arc and the summit of the cone, we shall have the meridians, which corresponding with an arc of a greater radius than that of the parallel, will intercept an angle smaller than a degree. In order to procure the degrees of latitude, we must bear upon one of these meridians, beginning at the point E, as well above as beneath, parts equal to the development of the arcs of the terrestrial meridian. In fine, we describe from the point P, and, by the divisions of the meridian, concentric circles which will represent the parallels.

When the cone ought to be partly inscribed, there is drawn by the points A and F, in which it must intersect the meridian, a secant A F, of which the junction R' with the axis C P, gives the point of concourse of the right lines which represent the meridians, or the summit of the cone; the right lines AR' being its side, and A*a* the radius of its base. The space AF, being that which corresponds with the arc AEF, ought to be divided like that arc. By this construction we take the chord AF for the arc AEF, and the degree of latitude is a little too small, when referred to the degree of longitude on the parallels of the points A and F; but the difference is a trifle when the arc of the meridian has little extent. Nevertheless, a perfect equality may be established between the degrees of latitude on the map, and those of the meridian of the sphere, by assuming, instead of AF, the development of the arc AEF, this circumstance, augmenting the distance of the radii *Aa* and F*f* of the parallels, somewhat prolongs the point of concurrence of the lines AR' and C P.

The point R' is obtained in general by reference to similar triangles:

R'A*a*, R'F*f*, which give

A*a* : F*f* : : AR' : FR'

A*a* F*f* : A*a* : : AR'-FR' or AF : AR'.

When we wish to have regard to the difference between the arc and its chord, we substitute to the line AF the developed length of the arc AEF.

§ 68. The astronomer, Delille (de la Croyère), who was charged with the construction of a general map of the Russian empire, wishing to avoid the inconveniences of the stereographic projection above mentioned, chose the conical projection; but in order to perfect it, he thought of making the cone enter into the sphere in such a way that it should intersect it according to two parallels, each placed at an equal distance from the middle parallel, and from one of the extreme parallels. The map had, by this mean, on the two parallels just mentioned, the same dimensions as the correspondent part of the sphere; and its total extent differed little from the country to be represented, because the excess at the two extremities of the map was at least compensated in part by the deficiency of the inscribed portion of the cone, with respect to the spherical zone. The map comprising from the fortieth degree of latitude to the seventieth, the middle parallel answered to 55°; and the parallels common with the spheres were those of 47° 30', and 62° 30'.

Euler occupied himself with this projection, but he substituted to the determination of the parallels, which must be common with the sphere, that of the point of concourse of right lines which represent the meridians, and of the angle which they make among themselves in the comprehended degree of longitude. His calculations are supported on the following grounds. 1. That the errors are equal on the southern and northern extremities of the map. 2. That they are also equal to the greatest of those which happen towards the middle parallel. He thence concludes that the point of concourse of the meridian ought to be placed beyond the pole by a quantity equal to five degrees of latitude, and that the angle of two consecutive meridians ought to be of 48' 44"*.

He then enquires how much the arcs of the great circles which measure the distances on the globe differ from the right lines which are substituted to them on the map; and he finds that an arc of 90°, 79, of the exactness of less than a hundreth part of its extent.

§ 69. There may be substituted to the conical projection made on the two parallels of the globe, a map which may coincide with three, by describing the extreme parallels and the middle parallels either as right lines, or as concentric circles of a given radius, then by di-

* Acta Academiæ Petropolitanæ, tom. 2. pars 1.

viding these parallels according to the law of the decrease of degrees of longitude, we shall procure three points for each meridian, which will be represented by the circle drawn through these three points. I shall not dwell on this projection, indicated, I believe, by Bion, in his book on the Use of the Globe; and which, like that of Ptolemy, is only the conical projection disfigured.

§ 70. Some geographers have also entertained the idea of developing in a right line all the parallels, and one of the meridians, that passing through the middle of the map; thus the parallels, which are all perpendicular to this meridian, correspond in spaces with the globe; there are then assumed in each the degrees of longitude according to the law of their decrease, that is to say, proportioned to the co-sines of the latitude; in fine, there passes through each series of the corresponding points of the division, a curve line which represents the meridian. From this construction, of which fig. 28, offers an example, it follows that, in respect to its parallels, the map presents throughout dimensions equal to those of the sphere; but the configuration is considerably altered on the sides by the obliquity of the meridians, so that the spherical rectangular quadrilaterals, comprised between the meridians and the parallels, are represented by mixtilinear trapeziums, of which the angles are very unequal, but the areas are in truth equal. This projection has been employed in the Atlas Celestis of Flamstead; in the four parts of the world by J. B. Bolin; and by several other geographers.

§ 71. Easy to trace, and preserving the relations of superficial extent among the different countries, this projection must have interested geographers; and an easy mean was soon discovered of correcting the defect occasioned by the obliquity of the meridians, by substituting to the right lines representing the parallels, concentric circles described from a point taken in the axis of the map, and passing by the divisions of that meridian, the position of their common centre is fixed according to the curve which it is proper to give them, that they may intersect all the other meridians with as little obliquity as possible. This projection, represented at fig. 29, is the most used in France in general maps, such as those of the four parts of the world; and among others, Delisle and d'Anville have employed it. The quadrilaterals, comprised between the parallels and meridians of this projection, are, as in the preceding, equivalent to those on the sphere. In both these, distances cannot be exactly measured, except on the meridians and parallels: and the scales of such maps only present approximations, which are, however, sufficient for the common purposes of geography.

§ 72. M. Delorgna has proposed a new projection, possessing the property of representing, by equal spaces, countries of equal extent*. In order to construct the map of a hemisphere, he conceives it to be divided into half-spindles, or half-gores, to use the mechanical term, by planes drawn through its axis; and upon the centre of the great circle perpendicular to that axis, he describes another, of which the area shall be equivalent to that of the hemisphere. It is easy to perceive that each half spindle will be represented on the circle in question by a sector, of which the angle will be equal to that formed by the two planes comprehended in the spindle. This is demonstrated, fig. 30, in which P represents the pole, A B D the plane of the equator, A P B a half-spindle comprised between two meridians and the equator, the circle A′ B′ D′ is that of which the area is equal to that of the hemisphere PABDE. It will be discovered without difficulty, that the radius A′C must, in general, be equal to the chord A P of the arc of the meridian, comprised between the pole and the plane, which terminates the spherical cup to be represented*.

In the polar projection traced after this principle, the meridians are the radii of the circle which terminates the map; the parallels are circles concentric to the first, described with a radius equal to the chord of the complement of the latitude; the quadrilaterals formed by the meridians and the parallels which terminate a zone, are equal and rectangular as on the sphere; and for this reason, the configuration of the countries is not much altered. The distances are not measured immediately by the right line which joins the two points to be compared; but it does not differ much, and the exact proportion may be easily deduced. These properties, which cannot be denied to the projection of M. Delorgna, constitute, in his opinion, those essential to a good geographical projection; and, in fact, it must be useful to adopt in common maps this projection, which is very easy to construct when a hemisphere is wanted terminated by the equator. The author has also pointed out the method of applying it to particular maps; but the drawing becomes complex when there is question of hemispheres terminated by the horizon, because we must then substitute to the meridians and parallels the azimuth circles, and the almicanters, or those parallel to the horizon of the place assumed for the centre of the map; circles to which we cannot refer the latitudes and longitudes, except by a particular construction or calculation. The inconvenience is the same with regard to hemispheres terminated by the meridian; but as I have said above, the difficulties of projection are of small account when advantages will result from it in the daily use of maps.

§ 73. The operations effected in the preceding century, in order to determine the figure of the earth by the measure of the degrees of the meridian, and of the

* Principi di Geografia Astronomico-Geometrica, Verona, 1789, 4to.

* In fact, if π represent the relation of the circumference to the diameter, R the radius of the sphere, h the height P c of the cup P a b d, and r the radius of the equivalent circle, we shall have:

$2 \pi R h = \pi r^2$, from which we draw $r^2 = 2 R h$; r is then the proportional middle between the diameter of the sphere and the segment P c.

parallels,

parallels, have given birth to a very important kind of projection, as it is that of the grand map of France by Cassini, the most beautiful geographical work which has been executed to the present day.

When the admeasurement of a degree of longitude was undertaken, the difficulty was seen that there is in drawing exactly on the earth a parallel to the equator*. In fact, if by an alineation, directed by the means of vertical rods, and perpendicular to the meridian of a place, we may determine a series of points, it is evident, that supposing the earth spherical, they would belong to a great circle determined by the vertical plane, drawn perpendicularly to the meridian in question, and which upon the earth answers to the celestial circle, which is called the first vertical. The parallel soon leaves that circle, which it only touches at the point where it intersects the meridian (§ 49). In a spheroid, the curve perpendicular to the meridian has a double bend, and the enquiry into its qualities has occupied many geometricians †.

The meridian and its perpendiculars being lines which are the most easily drawn by astronomical and geodesiac operations, it is to the meridian of the observatory at Paris, and to its perpendiculars, that the points of the map of France are immediately referred, their latitudes and longitudes having only been concluded a posteriori and by calculation ‡.

In order to form an idea of the manner in which this projection represents terrestrial spaces, it must be observed that the great circles perpendicular to the meridian, supposing the earth spherical, all intersect each other at the poles of that meridian, and, in consequence, converge one towards the other; (§ 49) while upon the map, where the same meridian is a strait line, they become parallel to each other. It thence follows, that the portions determined by two circles perpendicular to the meridian, are represented by rectangles of the same length, but larger towards their extremities. Thus the distances and the areas cannot be measured on the great map of France, but, by approximation, and because the extent in longitude is not so considerable, that the convergence of the perpendiculars to the meridian should produce an error of any consequence in the common occasions of geography.

§ 74. The rhumbs of the wind, or the directions indicated by the compass, which have the property of intersecting under the same angle all the meridians which they meet, and which, for this reason, bear on the globe the form of spiral lines, are also represented by curved lines of that kind in all the maps where the meridians are not parallels. Mariners, who direct all their courses by these lines, cannot, therefore, conveniently refer to that kind of map the course which they have made, nor find that which they mean to perform, because of the difficulty of measuring with compasses the arcs of a curve, and have, in consequence, sought a projection in which the meridians should be straight parallel lines.

When there is only occasion to represent very small spaces, or, at least, little extended in latitude, there may be substituted to the spherical zone the development of a cylinder, either inscribed or circumscribed on that zone, and of which the axis may coincide with that of the globe. The meridians which result from sections of the cylinder by planes passing through its axis, are represented by right lines parallel to that axis; the planes of the parallels intersect the cylinder according to circles parallel to its base, and which become right lines in the development. Such is the construction of *flat maps*, of which the invention is ascribed to Don Henry Prince of Portugal. Their defects are analogous to those of the conical projection, and even more considerable; for in this there may be given to two parallels their real length with regard to the degrees of latitude, and to one only on the flat maps, namely, to the inferior and superior for the development of the circumscribed cylinder. We might also employ the cylinder constructed on one of the intermediate parallels, and which would be in part interior and in part exterior to the sphere; but in this way, the extent in longitude would only be exact towards the middle, though the error would be divided betwixt the two extremities. Questions also present themselves here similar to those which Euler has resolved for the conical projection. It is evident, for example, that the parallel which serves as a base to the cylinder, might be placed in such a manner that the area of the development should be equal to that of the spherical zone.

The drawing of these maps may be effected without difficulty, as soon as the position of the terrestrial parallel to be developed is fixed; the only object being to give to the degrees of longitude on that parallel the size which they ought to have, in regard to that assigned to the degree of latitude.

The line H G, fig. 27, being supposed parallel to the axis C P, and equal to the development of the arc B F, will be the meridian of the map, intended to represent the zone comprehended between the parallels of the points B and F. The development of the middle parallel, whose radius is E *e*, will give the degrees of longitude. From the same figure may be observed the deficiency of the map on the extreme parallels, since the radius G *g* is smaller than B *b*, and the radius H *h* greater than F *f*.

These maps being only proper for very small parts of the world, are now nearly abandoned; and in the greater part of those to be met with, which are Dutch, there is no scale of longitudes, but only of latitudes and the rhumbs of the wind.

§ 75. The use which mariners make of charts is only to trace exactly in its length and direction the course which they have made, and to determine the distance from

* Mem. de Cassini, Acad. des Sciences, 1745.

† Mem. de l'Academie des sciences, année 1733.

‡ See the *Traité analytique des mouvemens apparens des corps célestes*, by Dulejour, t. ii, and the *Description géometrique de la France*, by Cassini.

from different parts of the coaſts, and the direction which they muſt obſerve to arrive at or to avoid them. It muſt be remarked, that by the direction to be followed to proceed from one point to another, mariners do not underſtand the neareſt courſe, which upon a ſphere is a circle, for the inſtrument of which they make uſe, the compaſs, does not indicate immediately the neareſt courſe, which interſects the different meridians under unequal angles (§ 49).

Mercator and Edward Wright have imagined the projection of *reduced maps*, which perfectly anſwer the conditions required. The meridians are there ſtrait parallel lines, equidiſtant, and interſected at right angles by the parallels to the equator; but the intervals which ſeparate them, increaſe in proportion as we advance towards the poles, in a relation preciſely the inverſe of the diminution of the degrees of longitude upon a globe. Thence it follows, however, that the diſtances in longitude, meaſured upon each parallel, have, with regard to the correſpondent diſtances in latitude, the ſame relation as on a globe.

The drawing of theſe maps is attended with no difficulty, except the conſtruction of the ſcale of latitudes, for which there are tables calculated with great care, even obſerving the oblate figure of the earth. They bear the name of tables of increaſing latitudes, becauſe of the augmentation of the length of each degree of latitude, in proportion as they approach the pole, and I ſhall indicate in another place the principles of their formation.

It is evident that there muſt not be ſought on the reduced maps neither the relations of the extent of countries, nor the exactneſs of their configuration, for this projection conſiderably augments the regions which are placed near the poles, although it ſhare with the ſtereographic projection, the quality of preſerving ſimilitude in very ſmall parts of the globe; but theſe defects are not attended with inconvenience in charts, which may be regarded as inſtruments, deſigned graphically to reſolve the principal queſtions of pilotage, which they do with the greateſt exactneſs and facility.

§ 76 It is to the developments of the *globe* that we muſt refer the conſtruction of ſpindles or gores, which are drawn upon paper in order to cover globes of a moderate ſize The ſurface of the globe is divided into twelve or eighteen parts, according to the ſize of its diameter, by drawing meridians from 30 to 30°, or from 20° to 20°. The ſpace comprehended between two of theſe meridians, having a very ſmall curve in regard to breadth, may be conſidered as forming part of a cylindrical ſurface, circumſcribed on the ſphere, according to the meridian which divides it into two equal parts This meridian being developed in bearing perpendicularly on each ſide, according to the law of ordinates, the half-widths of the portions or parallels comprehended between the meridians, which terminate the ſpindle, we obtain the form of its entire development. Sometimes it is truncated at the two extremities, at fifteen or twenty degrees from the poles; and theſe two zones are drawn apart as if they were flat. This procedure, as may be ſeen, is only an approximation, and can only ſerve for the manufacture of globes, as it admits the advantages of engraving in multiplying the number; for the drawing thence obtained, only preſenting diſjoined portions, cannot ſerve as a map. For this reaſon I ſhall not dwell on the ſubject, which more properly belongs to the conſtruction of geographical inſtruments.

§ 77. I have now deſcribed the different kinds of maps, and ſhewn their properties and defects; but it muſt be obſerved that the word defect only refers to the common way of conſidering maps; for if we regard them with Euler and Lagrange * as a tranſformation of co-ordinates, it is always mathematically poſſible to obtain on a map all the geographical relations which may be required. Only, as we have already obſerved, ſome relations are more eaſily obtained than others.

In fact, the poſition of different points of the ſphere being determined by their latitude and longitude, as the different points of the plane are by two co-ordinates, if we aſſume on a map lines ſubjected to a mathematical law, in order to repreſent theſe co-ordinates, we ſhall eſtabliſh, between the points of the map and thoſe of the ſphere, ſuch a relation that we may aſſign on the map the equation of the lines, which correſpond with circles, or even with any curves traced on the ſphere, and compare the relative ſpaces with each other. Reciprocally it may be aſked, what ought to be the nature of the co-ordinates of the map, that is, of the lines which repreſent the meridians and the parallels, in order that the parts of that map may have ſuch and ſuch a relation with thoſe of the ſphere? In reſolving this laſt queſtion by the moſt refined analyſis, Euler and Lagrange have determined *à priori* the conſtruction of different kinds of maps, according to the qualities which they ought to poſſeſs.

It is unneceſſary further to enlarge on this way of viewing maps. In this circumſtance, as in moſt others, neceſſity has conducted, by particular and indirect paths, to reſults immediately uſeful, long before the diſcovery of the general theory.

§ 78. When we have choſen the projection of the map about to be conſtructed, and traced the meridians and the parallels according to the law of that projection, the whole is divided into quadrilaterals, in which are inſcribed, according to their longitude and their latitude, the points which have thus been defined This operation becomes the more eaſy when the meridians and the parallels are reſtricted; and they are placed in conſequence from 10° to 10°, or from 5 to 5°, or even each degree, according to the extent of country given in the map. Maps are alſo diſtinguiſhed into *general or geographical*, as the planiſpheres, the four parts of the world, the great ſtates; *particular* or *chorographic*; and, in fine, *topographic*, which embrace only very ſmall extent, as the environs of a town for example, and preſent

* Mémoire d'Euler, *Acta Academ. Petropol.* tom. 1. p. 1. Mémoire de Lagrange. Acad de Berlin, année 1779.

sent in detail the villages, hamlets, and, by picturesque means about to be mentioned, the features of the land as woods, hills, valleys, rivulets, ravines, &c.

It is proper to remark, that, in whatever projection, the quadrilaterals formed by the meridians and the parallels near the centre of the map, differ so much the less from rectangular parallelograms, as they occupy small space on the map or on the globe; as the map is on a large scale; or as the meridians and parallels are more related to each other. Hence all the projections become blended with a geometrical survey, when the curve of the earth is little sensible throughout their extent; and the distances are then measured by rectilinear scales which indicate a certain number of itinerary measures used in the country represented, or in that where the map is composed.

When the effects of projection begin to be perceivable, the true way of indicating the size of the map, or its relation with the space represented, is to fix the size of a degree of latitude. It might be wished that there were adopted, for the different classes of maps, scales not only forming aliquot parts, but according to the decimal order, as has been appointed by the *Depot de la Guerre* for the maps to be there executed. By this mean, general maps become perfectly connected with particular maps, and topographical plans, because the details increase from one class to another by relations easy to seize.

The degree of latitude in the geographical maps being assumed as an unit, that of the chorographical map ought to be represented by one of the numbers 2, 5, or 2, which are exact divisions in the decimal system: and, in like manner, for the degree resulting from the dimensions of the topographic plan, with regard to the degree of the chorographic map.

A collection of maps, either of the world or of a country, is called an atlas; and the most convenient above all those which serve to facilitate the reading of a work, and not those in the largest form, but those which lead to the details by a gradual succession of maps more and more particular. The eye can rarely embrace without difficulty the considerable space comprised in a sheet of the largest paper, above all, when it must be unrolled, and numerous names are sought; but there are some cases in which the necessity of passing too frequently from one map to another becomes an inconvenience to be shunned, and maps of a large form are then more expedient.

§ 79. After these explanations, it may be conceived that the size of a map may be regulated according to the intention; and that maps ought to be constructed in the inverse order of their details; namely, the topographical plan reduced from plans taken trigonometrically upon the land; chorographical maps from an assemblage and reduction of topographical plans; and in fine geographical maps, properly so called, from an assemblage and reduction of chorographical maps.

I shall not here explain the methods of taking surveys, as they belong to geometry and trigonometry; but shall content myself with shewing how several surveys are united in one topographical plan.

In order that two particular plans may be joined, they must have two common points, or a line of the one may be applied on a line of the same denomination in the other. Then describing this line on the paper designed to receive the topographic plan, so that there may be on each side a space proper to comprise that about to be drawn, it only remains to combine by triangles, either with the points of that line common to the two plans about to be united, or with the points to be placed afterwards, all those comprehended in each plane; and, by constructing equal triangles, in a similar position with regard to the leading line on the topographic plan, the two plans may be united without difficulty. But if they must be reduced, as most commonly happens, triangles must be formed on the topographic plan, like those on the sheets of the survey, so that the sides of the first may be to those of the second in the relation exacted by the reduction.

When the leaves of the survey are marked with the meridian, either true or magnetic, and that this line is the same in all the sheets to be reunited, then the points of each leaf are referred to the meridian, and to a perpendicular drawn on that line, by a point common to two contiguous leaves. The distances of all the points from each of these right lines is measured parallel to the other, and these distances are referred, either such as they are, or reduced to the meridian and perpendicular drawn in the topographic plan, to represent those which are common to the sheets about to be joined. This leads me to speak of the frame divided into squares, employed in reducing all drawings, and which is very convenient for the construction of the details of maps.

The sheets which are to be united, are divided into squares by parallel lines, perpendicular to that which is common to the sheets, and the more they are multiplied there is the more facility in judging of the place to be occupied in each square, by the points and circumstances herein contained, and inscribing them with a strict resemblance in the corresponding squares traced on the reduced plan.

This operation is represented in fig. 31. The sheets A B C D, E F G H, having in common the right lines C D and E F, are divided into squares, of which the sides are parallel and perpendicular to these right lines; the reduced plan *a b f e* is divided in the same manner, in regard to the line *c d*, representing the common right line, but the sides of each square are the halves of those of the sheets A B C D, E F G H, so that the objects marked on these sheets are reduced to half their dimensions, and to a space forming only one quarter of what they occupied at first. To copy the design traced on each of the original leaves, we either imitate by the eye in the squares of the plan *a b f e*, what is contained in the correspondent squares of the sheets A B C D, E F G H, or rather, for more exactness, we take marks or numbers on each of the sides. When we do not wish to draw lines on the drawing to be copied, a very level

glass

glass of very equal transparency, is placed above it, upon which squares are drawn with a glazier's diamond, and two perpendicular lines are made to coincide on those which are to serve for the junction of the sheets or the points which determine it.

§ 80. When a topographical plan is thus formed by the union of detached surveys, in order to pass to chorographic maps, we must not only assemble the plans, but subject them to the projection to be adopted. For this purpose we trace on these plans the meridians and the parallels in right lines, respectively parallel and perpendicular, as these circles are when only extended over a very small portion of terrestrial surface. The correspondent quadrilaterals are also traced on the map to be constructed, but agreeably to the laws of projection; and there only remains to draw in these quadrilaterals what is contained in the squares comprehended between the meridians and the parallels of the topographic plan. When extreme precision is required, as these squares do not strictly correspond with the quadrilaterals, we take, by reference to the sides of the first, the distances of the principal points therein contained; these distances are converted into subdivisions of the degrees of latitude and longitude; and the like are taken from the parallel or meridian contiguous to the corresponding quadrilaterals of the map.

In thus constructing, by small portions, the drawing of a map, the embarrassment is saved which is occasioned by a too wide extension of the compasses; and great errors and their consequences are avoided, as the foundation rests on the sides of the same little square: besides this space being very small, any eye of the least experience immediately perceives the slightest error, which may have been committed in the transposal of the objects.

It may happen that the topographic plan is not marked with the points of the compass, or being marked in the direction of the magnetic needle, we do not know what was the variation of the needle at the time the plan was taken, or reduced, or even on the spot of the operations. This essential object may be supplied, when the plan contains two points of which the respective position is known; as in joining these two points by a right line, we shall find the angle which this right line forms with the meridian, and we may in consequence place it in its due relation to the meridian, or construct by means of a given angle the meridian of the plan.

By the same method may also be determined the scale of a topographical plan, when it has been omitted; for if we know the distance of two points in that plan, we have only to divide into parts, proportioned to the itinerary measures contained in this distance, the right line which joins these two points; which thus becomes the scale of the map, and shews the distance of all the other points from each other.

§ 81. The passage from chorographical maps to a general or geographical map is analogous to that from topographical plans to the chorographic map, by transposing into the quadrilaterals, formed by the meridians and the parallels of the geographical map, what is contained in the correspondent quadrilaterals of the chorographic maps, which are assembled and reduced.

It is above all in this last operation that we perceive the necessity of astronomical observations, in order to fix the position of points at some distance from each other: it may in fact happen, that in the topographical maps, which serve for the construction of the chorographic, there may be errors common to all points of the map, as distances too small or too large in the same direction, and that these errors remain on the chorographic maps; and, in re-uniting the latter upon a general map, the large spaces which it represents will be found too much restricted or dilated without the errors being perceived. But when there is placed directly on the chorographic maps, or, at least, on the geographic, a certain number of points, of a latitude and longitude strictly determined, these points will define upon the map certain spaces, in which these points and intermediate details may be laid down; and if this do not happen, the excess or deficiency perceivable, arising from the errors of many maps assembled, is divided among all the points of each, and thence becomes almost insensible, except there be some reason to ascribe the inaccuracy to particular points which must be corrected by the astronomical observations upon others.

To lend more exactness to the copies of their maps, it is upon the copper itself that the geographers of the *Depot de la Marine* execute their graduation; and they even attend to the alteration of dimensions occasioned by the drying of the paper. The procedure followed in these operations may be found in the Voyage of the ship Flora, drawn up by M. de Fleurieu, and the article Carte of the *Encyclopedie Methodique*.

§ 82. It is not difficult to perceive that we may, by the means above indicated, transfer upon globes the details marked in chorographic and geographic maps. This operation, which I have mentioned in § 46, consists in dividing, by meridians and parallels, the surface of the globe into quadrilaterals so small, that the curve of that surface may be little sensible, and to draw in these quadrilaterals what is contained in the correspondent quadrilaterals of the maps of various parts of the earth.

Such would be the procedure in the construction of maps, if we might in all countries begin with topographic maps, and materials reduced to the same measures, equally accurate and perfectly accordant; but unhappily this is not the case, there being but a small number of countries, and France alone completely, which have been trigonometrically surveyed. As to the other parts, there are only maps constructed after different methods, and upon data which are little exact. It is only in endeavouring to reconcile all those that represent the same country, that we know the degree of confidence that may be placed in each, and that we may approach the real delineation.

After some observations on itinerary measures, M. Lacroix thus proceeds:

When

When we have eſtabliſhed the agreement of the meaſures, or of the ſcales employed in different maps, we can conſtruct a graduation to thoſe which are deſtitute of it, as ſoon as we know, either immediately, or by the diſtances of given points, the latitudes and longitudes of whatever point of theſe maps. We may in conſequence compare, by the latitudes and longitudes which they aſſign to the ſame places, the maps which comprehend the ſame regions; and this manner is the more convenient, becauſe it eaſily permits a reference to the difference of projections in theſe maps.

The ſame point being thus placed under different latitudes and longitudes in ſeveral maps, in order to procure to theſe data the degree of confidence which they merit; it muſt be obſerved how theſe maps preſent other circumſtances, as the reſpective ſituations with regard to points well determined, ſuch as the capitals of large countries, or of their provinces, the diſtances of theſe towns from places of leſs conſequence, the configurations of the ſhores, of the courſes of the rivers, of the chains of mountains, of the l[illegible]roads, the limits of territory; and to examine i[illegible]at they agree and in what they differ under each of theſe relations. The latitudes, more eaſy to be obſerved than the longitudes, are generally better eſtabliſhed upon maps drawn on the relations of travellers. The common defect of the ancient maps is conſiderably to augment all the diſtances of the places in the direction of eaſt and weſt; and the error becomes the greater in proportion as the points are diſtant from the principal meridian, which regulates the longitudes of the others. This fault is very remarkable in the maps of Ptolemy with regard to the differences of longitude between Alexandria and the other towns upon the ſhores of the Mediterranean. The maps of the Sanſons, of Jaillot, and others compiled towards the end of the ſeventeenth century, alſo extend all the countries in the direction of the longitudes. Such maps ſtill furniſh uſeful materials when the poſitions are corrected in the direction of eaſt and weſt, by dividing, proportionally to the diſtance from the principal meridian, the difference between the longitudes aſſigned in theſe maps, and thoſe which reſult from new determinations.

In his *Companion to a Map of the World*, (London 1794, 4to.) Mr. Arrowſmith offers the following practical remarks on projection.*

"As the Earth is of a form approaching very near to a Globe, or Sphere, it is evident that the only Map which can truly repreſent the figure of the various countries, and their relative bearings and diſtances, muſt be delineated on the ſurface of a Globe.

"But as Globes of a ſize proper to exhibit a Map ſufficiently accurate, and containing all the information that is neceſſary or deſirable, muſt be very bulky, and very expenſive, it is neceſſary to have more portable and cheaper Maps, executed upon a flat ſurface; theſe, ſince the art of copper-plate printing has been in uſe, have generally been made upon paper.

"It is obvious, that ſuch a Map, wherein is attempted to repreſent upon a plane ſurface that which is really ſpherical, muſt depart conſiderably from the truth; eſpecially if it comprehends the whole, or a conſiderable portion of the world. It has, therefore, been an object which has engaged the attention of the moſt eminent geographers, to diſcover a projection (or arrangment, of the proportional parts of the Map) which ſhould be liable to the feweſt errors.

"The moſt natural method of repreſenting a ſphere upon a plane ſeems to be to divide it into two equal parts, and inſcribe each of them in a circle: but as the equator, and the polar axis, which interſects that circle at right angles, and makes one of the meridians, muſt be ſuppoſed equal in length to the half of the periphery, (of which it is not quite two thirds) it follows of courſe, that the countries delineated upon, or near, theſe lines, muſt be reduced to ſomewhat leſs than two thirds of the ſize of the countries of equal extent, which lie at the extremity of the circle; and that the lines drawn to meaſure the latitude, which are parallel to each other, or nearly ſo, muſt, in order to preſerve as nearly as poſſible their proportional angles at the points of interſection with the meridians, form ſegments of circles, of which no two are parallel or concentric.

"There may be as many different projections as there are points of view, in which a globe can be ſeen, but geographers have generally choſen thoſe which repreſent the poles, at the top and bottom of the Map; theſe, from the delineation of the lines of latitude and longitude are called the ſtereographic, orthographic, and globular projections.

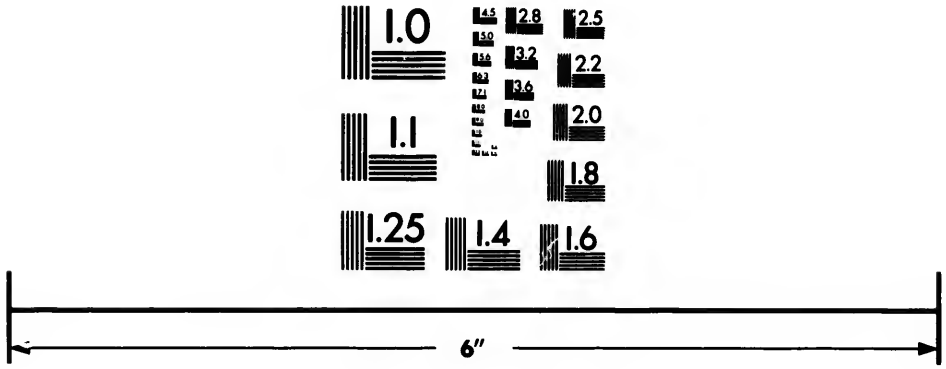
"I do not propoſe to detain the reader with a deſcription of all the projections; ſome of which are ſo erroneous (for the purpoſe of conſtructing of Maps) as to deſerve being conſigned entirely to oblivion. But as projections of Maps form a pleaſing and inſtructive exerciſe, and indeed indiſpenſably neceſſary to the right underſtanding of Geography, by ſtudents, I ſhall deſcribe the manner of conſtructing the Map that accompanies this work. But firſt hint at the Stereographic Projection.* Among the various poſitions aſſignable to the eye, there are chiefly two that have been adopted, wherein the eye is placed, either in the points (D fig. 1.) or removed to an infinite diſtance; and hence this projection is liable to the great error of diſtorting the form of the countries, repreſented upon it, much more than is neceſſary. The only advantage is, that the lines of latitude and longitude interſect each other at right angles.

"This being obſerved by that excellent aſtronomer,

* The grammatical errors are partly corrected.

* "The great geographer, D'Anville, has conſtructed his Map of the World upon this projection, adapting it to Caſſini's ſyſtem of the figure of the earth, which makes the polar diameter longer than the equatorial."

IMAGE EVALUATION
TEST TARGET (MT-3)



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M. de la Hire, * he invented a remedy for the inconvenience, by assigning to the eye a position at the point O (fig. 1) the distance of which, from the globe at D, is equal to the right sine of 45 degrees; and hence the right line G O, which bisects the quadrant B C, also bisects the radius E C, and produces the similar triangles O F G, and O E I; and thus the other parts of the quadrant B C, and in like manner of the whole semicircle A B C, are represented in the projection nearly proportionable to each other, and to the eye perfectly so.

"This projection, as coming the nearest to a true representation of the globe, is called the Globular Projection: it is equal to the Stereographic in point of facility, and vastly superior to it in point of truth.

"*Geometrical Construction of the* GLOBULAR PROJECTION.

"From the center C (fig. 2) with any radius, as C B, describe a circle; draw the diameters A B, and 90, 90, (be careful to draw them at perfect right angles) and divide them into nine equal parts; likewise divide each quadrant into nine equal parts, each of which contains ten degrees; if the scale admits of it, every one of these divisions may be subdivided into degrees: next, to draw the meridians, suppose the meridian 80° W. of Greenwich, we have given the two poles 90, 90, and the point 80 in the equator, or diameter A B; describe a circle to pass through the three given points as follows; with the radius 90, set one foot of the compasses on the point 90, and describe the semicircles X X and Z Z, then remove the compasses to the point 80, on the equator, and describe the arcs 1,1, and 2,2; where they intersect the semicircle, make the point, as at 1 and 2, and draw lines from a through the point 1, till they intersect the diameter B A, continued in E, then will E be the center from whence the meridian 90, 80, 90, must be drawn, and will express the meridian of 80° W. longitude from Greenwich. The same radius will draw the meridian expressing 140° W. longitude, in like manner. Draw the next meridian with the radius C B, set one foot of the compasses in the point d, and describe the arcs a a and b b, then draw lines as before, will give the point D, the center of 90° W. longitude, and so of all the rest.

"The parallels of latitude are drawn in the same manner, with this difference, that the semicircles X X and Z Z must be drawn from the points A and B, the extremities of the equator.

"In the manner above described, with great labour and exactness, I drew all the meridians and parallels of latitude to every degree on two hemispheres, which laid the foundation of the Map now before us.

"We shall now drop a few hints on the advantage and disadvantage of Mercator's Projection.

"A method has been found to obviate some of the difficulties attending all the circular projections by one, which, from the person who first used it, (though not the inventor) is called Mercator's Projection. In this there are none but right lines; all the meridians are equidistant, and continue so through the whole extent; but, on the other hand, in order to obtain the true bearing, so that the compass may be applied to the Map (or Chart) for the purpose of navigation, the spaces between the parallels of latitude, (which in truth are equal, or nearly so) are made to increase as they recede from the equator in a proportion which, in the high latitudes, becomes prodigiously great.

"The great advantages peculiar to this projection are, that every place drawn upon it, retains its true bearing, with respect to all other places; the distances may be measured with the nicest exactness by proper scales, and all the lines drawn upon it are right lines. For these reasons, it is the only projection in drawing maps or charts for the use of navigators.

"Its only disadvantage is, that the countries in high latitudes are of necessity increased beyond their just size to a monstrous degree.

"Thus it appears, from this short view of three of the best modes of projecting Maps of the World upon a plane surface, that each of those which have been more particularly described, is attended with advantages and disadvantages peculiar to itself; it is obvious, that the only means to acquire a just idea of the various countries upon such a surface, is by a comparison of two maps, one laid down on the Mercator's Projection, and the other upon the best of the Circular Projections."

* Hist. Acad. Scient. 1701.

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MAPS IN VOL. I.

PREPARING FOR PUBLICATION

A NEW MODERN

ATLAS

BY JOHN PINKERTON.

IT is propoſed that this Atlas ſhall conſiſt of at leaſt an equal number of maps with thoſe in the new edition of Mr. PINKERTON'a GEOGRAPHY; but of the ſize called Atlas, ſo as to correſpond with the celebrated works of D'Anville. Theſe maps will be delineated with all the ſuperior advantages, afforded by the lateſt improvements in geographical preciſion; and engraved with the utmoſt beauty that the ſtate of the arts can admit; ſo as to be a national and perpetual monument, worthy of the firſt commercial country in the world, and from whoſe exertions and enterpriſe have ariſen the moſt recent and important diſcoveries. Each map will be drawn under Mr. Pinkerton's own eye, reviſed with the utmoſt care; and will form, like the works of D'Anville, a complete record of the ſtate of the ſcience at the time of publication. Table lands, chains of mountains, and other features which belong to the natural geography of each country, will be indicated in a new manner, and with an exactneſs not to be expected from geographers who are unacquainted with that branch of the ſcience; which is however ſo eſſential that, without it, no country can be truly repreſented, nor works on natural and civil hiſtory perfectly underſtood. In the other parts, which illuſtrate civil hiſtory, equal care ſhall be exerted not to inſert obſcure hovels and villages, while places remarkable in hiſtorical record are totally omitted. Inſtead of careleſs poſitions, ariſing from the blind imitation of antiquated maps, the greateſt attention ſhall be beſtowed that every poſition be conformable to the lateſt aſtronomical obſervations; and, in default of theſe, to the reſult of the beſt itineraries, and other authentic documents.

The expence and labour of drawing and engraving ſuch an Atlas muſt neceſſarily be very great, and only capable of being repaid by a country in the firſt ſtate of opulence. But while the merely ornamental arts have met with a moſt liberal encouragement, in the publication of literary monuments of great expence, it may be hoped that a work, uniting great and laſting utility with beauty and magnificence, will not be neglected by a diſcerning public. It is ſuppoſed that the whole expence of this atlas, executed in a more capital ſtyle than has ever been before attempted, may be about twenty or twenty five guineas; and it is propoſed that it ſhall be publiſhed in numbers, each containing three or four maps. As the ſtyle of engraving will render firſt impreſſions deſirable, they will be carefully delivered in the order of names, which may be tranſmitted to the Publiſhers, Meſſrs. Cadell and Davies, in the Strand, and Meſſrs. Longman, Hurſt, Rees, and Orme, Paternoſter-Row.

MODERN

MODERN GEOGRAPHY.

PRELIMINARY OBSERVATIONS.

THE word *geography* is derived from the Greek language, and implies a deſcription of the earth. It is ſometimes contraſted with *hydrography*, which ſignifies a deſcription of the water, that is of ſeas, lakes, rivers, &c., thus including marine charts: but, in general, hydrography is rather regarded as a province of geography. Both were anciently conſidered along with aſtronomy, as parts of *coſmography*, which aſpired to delineate the univerſe. Definitions.

Geography is more juſtly contraſted with *chorography*, which illuſtrates a country or province; and ſtill more with *topography*, which deſcribes a particular place, or ſmall diſtrict.

What is called General Geography embraces a wide view of the ſubject, regarding the earth aſtronomically as a planet, the grand diviſions of land and water, the winds, tides, meteorology, &c. and may extend to what is called the mechanical part of geography, in directions for the conſtruction of globes, maps, and charts.

Among the other diviſions of this ſcience may be named Sacred Geography, ſolely employed in the illuſtration of the Scriptures; Eccleſiaſtic Geography, which deſcribes the government of the Church, as divided into patriarchates, archbiſhopricks, biſhopricks, archdeaneries, &c. with their reſpective boundaries, often varying much from thoſe of the ſecular provinces; and Phyſical Geography, or Geology, which inveſtigates the interior of the earth, ſo far only as real diſcoveries can be made; for what have been ſtyled ſyſtems of the earth, which have conſumed the labours of many ingenious men, have no connection

with

with the ſolid ſcience of geology, but ought rather to be ſtyled coſmogonies, or ideal creations of planets.

But Geography, popularly conſidered, is occupied in the deſcription of the various regions of this globe, chiefly as being divided among various nations, and improved by human art and induſtry. If a ſcientific term were indiſpenſable for this popular acceptation, that of Hiſtorical Geography might be adopted, not only from its profeſſed ſubſervience to hiſtory, but becauſe it is in fact a narrative ſo nearly approaching the hiſtorical, that Herodotus, and many other ancient hiſtorians, have diverſified their works with large portions of geography, and the celebrated deſcription of Germany, by Tacitus, contains moſt of the materials adopted in modern treatiſes of geography.

Diviſions of Geography.

In this popular point of view, hiſtorical geography admits of three diviſions. 1. The Ancient or Claſſical, which deſcribes the ſtate of the earth, ſo far as it was diſcovered at different periods, but not extending further than the year of Chriſt 500. 2. That of the Middle Ages, which reaches to the fifteenth century, when the diſcoveries of the Portugueſe began to lay wider foundations of the ſcience. 3. Modern Geography, the ſole ſubject of the preſent work, which, while it embraces the moſt recent diſcoveries, ſtill remains capable of great acceſſions, particularly in Africa; not to mention more minute deficiencies.

The chief object of modern geography is to preſent the moſt recent and authentic information concerning the numerous nations and ſtates who divide and diverſify the earth; but on this ſubject it is impoſſible to attain accurate ideas without a brief introductory view of the progreſs of each nation and ſtate. Though, in ſome few inſtances, natural barriers have divided, and continue to divide, nations, yet in general the boundaries are arbitrary, ſo that the natural geography of a country, though forming an eſſential feature, hitherto treated with too much neglect in geographical works, cannot be admitted to a predominance; but on the contrary, as matter yields to mind, may rather be regarded as a ſequel in hiſtorical geography, which is chiefly occupied in deſcribing the diverſities of nations, and the conditions of the various races of mankind. On this ſubject there is no doubt room for a variety of

of opinions; but after long consideration it has appeared most eligible to prefer the following order: 1. The historical, or progressive geography of each country. 2. Its political state, including most of the topics which recent German writers, by a term of dubious purity, call statistic. 3. The civil geography, including objects not so immediately connected with the government, as an account of the chief cities, towns, &c. 4. The natural geography[1]. Order of topics.

The ancients considered the earth under the three grand divisions of Asia, Europe, and Africa; yet, as they all form one continent, the distinctions were arbitrary, as they often included Egypt under Asia, and they had not discovered the limits of Europe towards the N. E. Modern discoveries have added a fourth division, that of America, which, exceeding even Asia in size, might perhaps as well have been admitted under two grand and distinct denominations, limited by the Isthmus of Darien. It was supposed, till within these thirty years, that there existed a vast continent in the south of the globe, and many schemes were formed for colonizing the wide and opulent *Terra Australis;* but the second navigation of the immortal Cook dispelled this visionary land from geography, or demonstrated, that if any continent there existed, it must be lost in the uninhabitable ice of the south pole. Yet the wide extent of New Holland rewarded the views of enterprise. Too large for an island, too small for a continent, New Holland, like the other works of nature, eludes the petty distinctions of man; and while geographers hesitate whether to ascribe it to Asia, or, with De Brosses, to denominate it a FIFTH specific division of the earth, it is not Quarters of the world.

[1] This arrangement was in part suggested by the *Essai sur l' Histoire de Geographie* by Robert de Vaugondy. The plan of this work has been generally approved on the Continent as well as in England, though some readers incline to think that the fourth article should be the first; in which case they may read the fourth chapter before the others, of which the succession has not yet been arraigned. In a map of any country (and maps form the chief base of geography in a strict sense of the term) the first features that occur are the name of the country, the provinces, the cities, and towns, in short all that relates to man and human history. An uninhabited country would excite little attention however distinguished by the grand characters of nature; and any country is only recommended to more or less notice by its history and the merits of its inhabitants. The appearance even of some countries, as Holland, &c. is wholly changed by human art and industry. These considerations will be found to corroborate the propriety of the plan here adopted, in which the natural geography, itself in a great measure subject to human industry, is placed in the last rank.

 improbable

improbable that the popular division of four quarters of the world will continue to predominate over any scientific discussion[1].

Of the grand divisions of the earth Asia has ever been the most populous, and is supposed to contain about 500,000,000 of souls, if China, as recently averred, comprize 330,000,000. The population of Africa may be 30,000,000, of America 20,000,000: and 150,000,000 may be assigned to Europe*.

Face of the globe.

Recent discoveries have evinced that more than two thirds of this globe are covered with water; and these waters, whether oceans, seas, lakes, or rivers, are contained in hollow spaces, more or less large, which late French geographers have styled *bassins*, or basons, by a term of little dignity. They may as well be called Concavities; while, on the other hand, the chief Convexities or Protuberances of the globe, by the French styled *plateaux*, consist of elevated uplands, sometimes crowned by mountains, sometimes rather level, as in the extensive central protuberance of Asia. In either case, long chains of mountains commonly proceed from those chief convexities, in various directions; and the principal rivers usually spring from the most elevated grounds. Though the low and fertile plains, generally perceivable for a long space before rivers enter the sea, be often deposited by their waters, as in the Delta, and other instances, yet the geologist would in vain attempt general rules; while, as on a small scale, deep glens are found without any rivulet, so on a large, vast and extensive hollows will appear, without the smallest trace of their having being pervaded by a river.

Oceans.

The grandest concavity of this globe is filled by the Pacific Ocean, occupying nearly half of its surface, from the eastern shores of New Holland to the western coast of America; and diversified with several groups of islands, which seem as it were the summits of vast moun-

[1] The word *quarter*, as denoting a fourth part, becomes rather a solecism, when applied to the four grand divisions of the earth: it may be accepted in a second sense, equally popular in French and English, (whence derived?) which signifies a particular region, or station: yet a fifth or sixth *quarter* of the world would not please the ear. The *Magellanica* of Cluverius and De Brosses has faded before the light of recent discoveries; but the *Australasia* and *Polynesia* of the latter are excellent and clear arrangements, now justly adopted by most men of science.

* Australasia and Polynesia, or New Holland and the isles in the Pacific, probably do not contain above half a million.

tains

tains emerging from the waves. This chief concavity, ſeparately conſidered, receives but few rivers, the chief being the Amur from Tatary, and the Hoan Ho and Kian Ku from China, while the principal rivers of America run towards the eaſt.

The next grand concavity is that of the Atlantic Ocean, between the ancient continent and the new. A third is the Indian Ocean.

The ſeas between the arctic and antarctic circles and the poles, have been ſtyled the Arctic and Antarctic Oceans; the latter having ſupplanted the Terra Auſtralis, and being in fact only a continuation of the Pacific, Atlantic, and Indian Oceans; while the Arctic Sea is partly embraced by continents, and receives many important rivers.

Such are the moſt profound concavities of the globe, while others are filled by more minute ſeas, as the Mediterranean, the Baltic, and others of yet ſmaller extent, till we deſcend to inland lakes of freſh water.

Oblong concavities, ſometimes of great length, mark the courſes of the rivers; which, generally, at firſt interſect the higher grounds, till the declivity become more gentle, on their approach towards their inferior receptacles. But as general views are ſeldom preciſe, it muſt not be forgotten, as already in part obſerved, that even large rivers ſometimes ſpring from lowland marſhes, and wind through vaſt plains, unaccompanied by any concavity, except that of their immediate courſe; while, on the other hand, extenſive vales, and low hollow ſpaces, frequently occur, deſtitute of any ſtream. Rivers will alſo ſometimes force a paſſage, where nature has erected mountains and rocks againſt it; and where the *baſſin* of the French would appear to be in another direction, which the river might have gained with more eaſe; ſo eſtranged is nature from human theory. In like manner though the chief chains of mountains in Europe extend in a ſouth eaſterly and north weſterly direction, yet there are ſo many exceptions, and ſuch numerous and important variations in other parts of the globe, that theory in vain attempts to generalize. As mountains may be found in every direction of the compaſs, ſo a river may riſe from an inland lake or marſh, and force its way through rocky barriers of great elevation. In ſhort the theory of the French geographers, though juſt in general, muſt not be too widely accepted: and the book of nature muſt be regarded as the chief code of conſultation. Rivers.

Continents.

From the vaſt expanſe of oceanic waters, ariſes in the ancient hemiſphere, that wide continent, which contains Aſia, Europe, and Africa; and in the modern hemiſphere the continent of America, now diſcovered to form, as it were, a ſeparate iſland, divided by a ſtreight of the ſea from the ancient continent. In the latter many diſcoveries, of the utmoſt importance to geography, are of very modern date, and it is not above ſixty years ſince we obtained an imperfect idea of the extent of Siberia, and the Ruſſian empire: nor above twenty ſince ample, real, and accurate knowledge of theſe wide regions began to be diffuſed. So that in fact America may be ſaid to have been diſcovered before Aſia: and of Africa our knowledge continues imperfect, while the neweſt obſervations, inſtead of diminiſhing, rather increaſe our ideas of its extent.

But the grandeſt diviſion of the ancient continent is Aſia, the parent of nations, and of civilization; on the north eaſt and ſouth, ſurrounded by the ocean; but on the weſt divided by an ideal line from Africa; and from Europe by boundaries not very ſtrongly impreſſed by the hand of nature. The Ruſſian and the Turkiſh empires, extending over large portions of both continents, intimately connect Aſia with Europe. But for the ſake of clearneſs and preciſion, the chief merits of any work of ſcience, geographers retain the ſtrict diviſion of the ancient continent into three great parts, ſacrificing a more minute to a more important diſtinction; which, if not ſtrictly natural, is ethical, as the manners of the Aſiatic ſubjects of Ruſſia, and even of Turkey, differ conſiderably from thoſe of the European inhabitants of thoſe empires.

As Europe is the ſeat of letters and arts, and the greateſt exertions of human energy in every department; and is beſides the native region of the chief modern geographers, and that in which the readers are moſt intimately and deeply intereſted, it is always the diviſion firſt treated; though the order be arbitrary, and Ptolemy, who has been ſtyled the father of geography, begins indeed with Europe, but deſcribes Africa before Aſia*. Before proceeding more minutely to conſider the ſeveral kingdoms and ſtates, compriſed in this great diviſion of the globe, it will be proper, in compliance with an uſual and unobjectionable form, to offer a brief and general deſcription of this diſtinguiſhed portion of the earth.

* The beſt edition of his maps, Amſt. 1730, places Africa firſt.

EUROPE.

THIS part of the globe is the ſmalleſt in extent, yielding conſiderably even to Africa. From the Portugueſe Cape, ſtyled by our mariners the Rock of Liſbon, in the weſt, to the Uralian mountains in the eaſt, the length may be about 3,300 Britiſh miles; and the breadth from Cape Nord, in Daniſh Lapland, to Cape Matapan, the ſouthern extremity of Greece, may be about 2,350. The contents in ſquare miles have been eſtimated with ſuch diverſity of opinion, ſuch eſtimates being, in truth, arbitrary and only comparative, that it is ſufficient to mention the medial number of about two millions and a half. Extent.

The ancients had no juſt ideas of the boundaries of Europe, the name itſelf having ſeemingly originated from a ſmall diſtrict near the Helleſpont, as the diſtinctive name of Aſia alſo ſpread from the oppoſite ſhore. More than a third part of Europe, towards the north and eaſt, has only been known with preciſion in modern times. On the ſouth it is limited by the Mediterranean ſea; on the weſt by the Atlantic, which contains the moſt remote European iſlands, the Azores and Iceland, Greenland being regarded as a part of North America. On the north the boundary is the Arctic Ocean, embracing the remote iſles of Spitzbergen, and Novaya Zemlia, or the New Land. Toward the eaſt the boundaries admit of ſome diſcuſſion. The Uralian mountains, a grand natural limit, not extending to the Arctic Ocean, the river Cara, which flows into the ſea of Karſkoye, is admitted as a boundary. The Uralian limit extends to about 56 degrees of north latitude: to the ſouth of which the grand confines of Europe and Aſia have been ſought in the petty diſtinctions of Ruſſian governments. More natural limits might be obtained by tracing the river Oufa, from its ſource, to its junction with the Belaia. Thence along the Kama to the Volga, which would conſtitute a ſtriking natural diviſion, to the town of Sarepta; whence a ſhort ideal line, the only one admitted in this delineation, will lead due weſt to the river Don, which would complete the unaſ- Limits.

certained

certained boundary; that on the north and weſt of the Euxine being clear and preciſe.

Ancient population.

The ancient population of Europe conſiſted of the Celts in the weſt and ſouth; the Fins in the north eaſt; and the Laps or Laplanders, a diminutive race like the Samoieds of Aſia, in the furtheſt north, and who ſeem to have enriched their original rude language by adopting, in a great meaſure, that of their more civilized neighbours the Fins. Thoſe ancient inhabitants, who ſeem to have been thinly ſcattered, were driven towards the weſt and north by the Scythians or Goths from Aſia, whoſe deſcendants occupy the greater part of Europe; by the Sarmatians, or Slavonic tribes, alſo from Aſia, the anceſtors of the Ruſſians, Poles, &c. and who were accompanied by the Heruli, uſing what is now called the Lettic ſpeech, to be found in Pruſſia, Lithuania, Samogitia, Courland, and Livonia, being a-kin to the Slavonic language[3], yet with many ſhades of diſtinction. From Africa the colony of Iberi, northern Mauretani, paſſed into Spain at a very early period. The latter acceſſion of Hungarians and Turks, from Aſia, may likewiſe be commemorated.

Progreſſive geography.

The progreſſive geography of Europe will be more aptly illuſtrated in the deſcriptions of each kingdom and ſtate. Suffice it here to obſerve, that the ableſt modern geographers, not excepting D'Anville himſelf, have greatly erred in their views of the ancient knowledge of Europe. Of Scandinavia the ancients only knew the ſouthern part, as far as the large lakes of Weter and Wener. The Roman ſhips explored the ſouthern ſhores of the Baltic as far as the river Rubo, or the weſtern Dwina, and diſcovered the names of ſeveral tribes along the ſhores: but of the central parts of Germany it is evident, from the maps of Ptolemy, that they had no juſt ideas; ſo that the tribes which he enumerates may be more juſtly aſſigned to the northern parts along the Baltic, or to the ſouthern on the left of the Danube. The Carpathian or Sarmatian mountains were well known, but the line of 50° or 52° of north latitude, muſt confine the ancient knowledge in the north eaſt. A ſingularity in the ancient deſcriptions has often miſled; for as the mountains, in the ſavage ſtate of Europe, were crowned or accom-

[3] Tooke's View of Ruſſia, i. 455.

panied

panied with forests, the same term was used in several barbarous languages to express either; so that the ancients often place important mountains, where the hand of nature had only planted large forests. This remark becomes essential in the comparison of ancient and modern geography. The Riphæan mountains are vainly supposed to have been the Uralian chain, which were to the ancients hid in the profoundest darkness, instead of a large forest running from east to west. The Sevo Mons of Pliny, which he positively assigns to the north of Germany, though geographers, in direct opposition to his text, transfer it to Norway, a region almost as unknown to the ancients as America, must be regarded as a vast forest, extending to some promontory: and the Venedici Montes of Ptolemy are in the like predicament, for modern knowledge evinces that no such mountains exist. Of all sciences, perhaps geography has made the most slow and imperfect progress, and the first restorers of it place at random many grand features of nature, instead of pursuing the recent and just plan, of giving an exact delineation of the country, and afterwards exploring the real extent of ancient knowledge.

The christian religion prevails throughout Europe, except in Turkey, where however at least one half of the inhabitants are attached to the Greek church. Wherever the christian faith has penetrated, knowledge, industry, and civilization have followed: among the barbarous tribes in the north the progress was unhappily slow, Scandinavia remaining pagan till the eleventh century; and some Slavonic tribes on the south of the Baltic till the thirteenth: nay it is not above a century ago, since the Laplanders were converted by missions from Denmark. The two grand distinctions are catholics and protestants, the former in the south, where the passions are more warm, and the imagination more delighted with splendour: the latter in the north, where the satisfaction of the judgment predominates. Religion.

This universality of the christian religion has been followed by another superlative advantage, that of constituting all Europe, as it were into one republic, so that any useful discovery made in one state passes to the rest with celerity. In this respect Europe has been compared to

ancient Greece; and it is to be hoped that Ruſſia will not prove another Macedon.

Climate. This fair portion of the globe is chiefly ſituated in the temperate zone, if ſuch diſtinctions have not vaniſhed from geography, ſince modern diſcoveries have evinced that the climate often depends on local cauſes; that the Alps is a ſouthern latitude preſent mountains of ice unknown in Lapland; that the torrid zone abounds with water and habitations, and may perhaps contain mountains covered with ſnow. Yet freedom from the exceſſive heats of Aſia and Africa has contributed to the vigour of the frame, and the energy of the mind.

Inland ſeas. In a general view of Europe, one of the moſt ſtriking and intereſting features is the number and extent of the inland ſeas, juſtly regarded as chief cauſes of the extenſive induſtry and civilization, and conſequent ſuperiority to the other grand diviſions of the globe. Had Africa been interſected by a large inland ſea from the weſt, it is probable that the bleſſings of induſtry would have been widely ſpread. Among inland ſeas the Mediterranean is juſtly pre-eminent, having been the center of civilization to ancient and modern Europe. The columns of Hercules marked its weſtern boundary, being the mountain or rock of Abyla, now called Ceuta, and Kalpe in Spain, the Gibraltar of modern fame. The length of the Mediterranean is about 2000 miles to its fartheſt extremity in Syria; but in ancient maps the length has been extended to about 2500 miles. On its northern ſide open two immenſe gulphs, that of Venice, and the Archipelago; the former being the Adriatic, the latter the Egean ſea, of the ancients. From this laſt a ſtreight, called the Helleſpont, conducts to the ſea of Marmora the claſſical Propontis: and another now ſtyled the ſtreight of Conſtantinople, the ancient Thracian Boſphorus, leads to the Euxine, or Black Sea; which, to the north preſents the ſhallow Palus Mæotis, or ſea of Azof, the utmoſt maritime limit of Europe in that quarter. This wide expanſe of the Mediterranean is beautifully ſprinkled with iſlands, and environed with opulent coaſts, abounding with the moſt ſublime and pictureſque features of nature: tides are not perceivable, except in the narroweſt ſtreights; but according to phyſiologiſts there is a current along the Italian ſhore, from the weſt to the eaſt, and towards the African coaſt

in an oppofite direction. In the Adriatic the current runs north-weft along Dalmatia, and returns by the oppofite fhore of Italy. The Mediterranean abounds with fifh, many of which are little known in more northern latitudes. The chief fifheries are thofe of the tunny, of the fword fifh, and of the fea dog, a fpecies of fhark, and of the diminutive anchovy. It is alfo the chief feminary of coral, now known to be the work of marine infects. This fuppofed plant is of three colours, the red, the vermillion, and the white; and its greateft height is about eleven inches. It is equally hard in the fea, and in the air; and is generally brought up by a kind of net from the depth of 60 to 125 feet[4]. To enumerate and afcertain fhoals and rocks is the office of the hydrographer; but fifhing banks are of general importance, and fome are found near Sicily. The Black fea is faid to derive its name from its black rocks, or dangerous navigation; but it is difficult to account for fuch terms, often derived from the fertile and fuperftitious fancy of mariners. The fea of Azof is polluted with mud, whence it was ftyled Palus, or a marfh, by the ancients: it is united to the Euxine by the ftreight of Caffa, the ancient Cimmerian Bofphorus.

The fecond grand inland fea of Europe is the Baltic, by the Germans called the Eaftern Sea; whence the Eafterlings of Englifh hiftory, people from the fhores of the Baltic. This extenfive inlet opens from the German fea, by a gulph pointing N. E. called the Skager Rack; and afterwards paffes fouth, in what is called the Cattegat, to the S. E. of which is the Sound of Elfinore, a ftreight where veffels pay a tribute of courtefy to Denmark. The Baltic afterwards fpreads widely to the N. E. and is divided into two extenfive branches, called the gulphs of Bothnia and Finland, both covered or impeded with ice for four or five months of the northern winter. Ancient hiftorians even report that wolves have paffed on the ice from Norway to Jutland; and, if veracious, the rigour of the feafons muft have greatly abated. The greateft depth of this fea is faid not to exceed fifty fathoms. Swedifh phyfiologifts pronounce that it lofes about four feet in extent in the courfe of a century; and that the water does not contain above one thirtieth part of falt, whereas other fea water often holds a tenth: this

[4] Spallanzani's Trav. in the Two Sicilies, iv. 317.

freſhneſs they impute to the quantity of ice; and they alſo aſſert, that when the north wind blows, the waters become ſo freſh, that they may even be employed for domeſtic uſes. Tides are unknown, and the fiſh are few.

The third and laſt inland ſea of Europe is that called the White Sea, in the north of Ruſſia, more known in Europe, and particularly to Engliſh enterprize, before the commerce of Archangel was ſupplanted by that of Peterſburg. To Octer, in the reign of the great Alfred, it was known by the name of the Qven Sea; and the Icelandic writers ſtyled it the ſea of Ganviik, on the ſhore of which was their Biarmia. The White Sea contains a number of ſmall iſlands; but the accounts yet given have been brief and unſatisfactory.

Other ſeas. Among the other maritime diviſions may be named the German ſea, ſo called becauſe it waters the weſtern ſhores of ancient Germany, from the Rhine to the extremity of Jutland. It is now often ſtyled, with ſufficient impropriety, the North Sea, a term probably adopted by us from the Dutch. It may be regarded as a part of the Atlantic ocean, terminating at the ſtreights of Dover; whence the Britiſh Channel extends to the weſt. The bay of Biſcay is another large inlet of the Atlantic. The Briſtol Channel is rather the eſtuary, or wide frith, of the Severn. Between Great Britain and Ireland are St. George's Channel on the ſouth; the Iriſh ſea in the centre, which leads to the North Channel. That part of the Atlantic which paſſes between Scotland and the extreme range of the weſtern iſles, from Barra to Leuis, has received no diſtinct appellation, though it might be aptly ſtyled the Hebudian Channel. To the north of Scotland is the Deucaledonian ſea of the ancients; which being conſidered as extending into and throughout the Baltic, was alſo ſtyled the Sarmatian.

Arctic ocean. To the north of Europe is the Arctic ocean, the diſmal and ſolitary reſervoir of myriads of miles of ice, the very ſkirts of which, floating in enormous mountains, crowned with brilliant pinnacles of every hue, delight the eye and appal the heart of the mariner. Yet this enormous waſte is, in the hand of Providence, a fertile field of proviſions for the human race. Here the vaſt battalions of herrings ſeem to ſeek a refuge from numerous foes, and to breed their millions in ſecurity. About

the middle of winter, emerging from their retreat, they ſpread in two diviſions, one towards the weſt, which covers the ſhores of America, as far as the Cheſapeak and Carolina; while a third more minute ſquadron paſſes the ſtreight between Aſia and America, and viſits the coaſts of Kamſchatka[1]. The moſt memorable diviſion reaches Iceland about the beginning of March, in a cloſe phalanx of ſurpriſing depth, and ſuch extent, that the ſurface is ſuppoſed to equal the dimenſions of Great Britain and Ireland. They are however ſubdivided into numberleſs columns of five or ſix miles in length, and three or four in breadth, followed by numerous ſea fowl, and perceivable by the rippling of the water, and a brilliant reflexion like that of a rainbow. In April or May the vanguard of thoſe allotted to the Britiſh dominions reaches Shetland, and the grand body arrives in June; towards the end of which month, and through that of July, they are in the greateſt perfection, a circumſtance well known to the Dutch fiſhers, who then caught that ſuperior ſort which formed the grand ſource of the wealth of the United Provinces. From Shetland one diviſion proceeds towards the eaſt, as far as Yarmouth, where they appear in October. The other brigade paſſes to the weſt, along both ſhores of Ireland. A few ſtragglers are found at irregular periods, having proceeded beyond their powers of return; but it is generally credited, that millions regain the Arctic Ocean, and depoſit their ſpawn about the month of October.

To enumerate the ſmaller gulphs, the ſtreights, and other minute diverſities of the ſeas, either in a feeble ſeries of names, or in a dry arithmetical table, would be ſuperfluous, as they are beſt ſtudied in the maps, and as that mode of communicating ſcience is perhaps of all others the moſt uncouth and repulſive. As well might hiſtory be ſtudied by the barren repetition of a hundred names of ſtateſmen and warriors. But this account of the European ſeas muſt not be cloſed without a few brief hints on a ſubject generally neglected in works of this nature, the large Banks, or comparative ſhoals, ſuppoſed to be ridges of ſubmarine mountains, and which being frequently the reſort of cod and other fiſh, invite the attention of national induſtry. The

Sand Banks.

[1] Pennant Arctic Zool. i. ccxi.

Good-

Goodwin ſands, off the coaſt of Kent, are rather dangerous to the mariner, than inviting to the fiſher; but on the coaſt of Holland there are many banks which ſupply excellent fiſh, as turbot, ſoal, plaice, &c. Further to the north is the extenſive Dogger bank, ſtretching ſouth-eaſt and north-weſt; beginning about twelve leagues from Flamborough head, and extending near 72 leagues towards the coaſt of Jutland. Between the Dogger and the Well Bank, to the ſouth, are the Silverpits of the mariners, which ſupply London with cod, a fiſh which loves the deep water near the banks, while the flat fiſh delight in the ſhallows. Near the Dogger Bank was fought the noted engagement with the Dutch in 1781. The Ore and the Lemon lie between theſe banks and the Britiſh ſhores. To the north eaſt of the Dogger bank is the Horn-riff, a narrow ſtrip extending to Jutland: the Jutts-riff is a ſand-bank ſtretching, like a creſcent, from the mouth of the Baltic into the German ſea.

The Mar Bank begins oppoſite to Berwick, but is only about fifteen miles in length. Further to the eaſt extends the Long Fortys, of great extent, from Buchan Neſs to Newcaſtle; and from forty to one hundred miles diſtant from the ſhore. From the coaſt of Buchan a bank alſo reaches acroſs the German ſea towards the Jutts-riff. What are called the Montroſe Pits, as being in the latitude of that town, though to the eaſt of the Long Fortys, are hollows, from three to four miles in diameter, from ſeventy to one hundred fathom deep, with a ſoft muddy bottom, in a bank of gravel about fifty miles long, under forty fathom of water.

In the open Atlantic the largeſt bank is that of Newfoundland, reſerved for the deſcription of the American ſeas; but there is a conſiderable bank to the weſt of the Hebudes, abounding with cod and other fiſh.

Rivers and mountains.

The chief rivers of Europe are deſcribed under the reſpective countries through which they flow. Of the vaſt Wolga, far the greater part is included in Europe: the Danube is the next in fame; and is followed by the Dnieper, or Nieper; the Rhine, and the Elbe. The moſt elevated mountains are the Alps, which are followed by the Pyrenees, and the extenſive ridge which divides Norway from Sweden. The Carpathian

Carpathian mountains, and the chain of Emineh, or Hæmus, are, with the Apennines, of inferior extent and height. In the particular descriptions these grand and immoveable features of nature, which unaccountably have only attracted due attention within these few years, will be found to be illustrated as far as the materials would permit.

The kingdoms and states of Europe may be considered, 1. As despotic monarchies, as those of Russia and Turkey; 2. Absolute monarchies, as Spain, Denmark, &c.; or, 3. Limited monarchies, as the Empire of Germany, kingdom of Great Britain, &c. Since the fall of Venice, and the subversion of Switzerland and Holland, scarcely an example occurs of permanent and fixed aristocracy, or the hereditary government of nobles. Of democracy, or more strictly speaking, elective aristocracy, a few cities, and some Swiss cantons, may preserve a semblance; while France at the present *hour* is a military despotism, under the name of an empire. Governments.

According to the plan of this work, already explained in the Preface, the various states of Europe will be arranged in three divisions, considering them according to their real consequence, as of the first, second, or third order; and each will be treated at a length proportioned to its weight in the political scale, and the consequent interest which it inspires. A small state may indeed sometimes excite a more just curiosity than one of larger dimensions; but such considerations are foreign to an exact system of Geography, detailed in a precise order of topics, and extended with impartial views over the whole circle of human affairs. Foreigners may object that too much space is allotted to the British dominions; but the same objection might extend to every system ancient and modern, as the authors have always enlarged the description of the countries in which they wrote. His native country ought also to be the chief subject of every reader; nor can much useful knowledge, (for our knowledge chiefly springs from comparison,) be instituted concerning foreign regions, till after we have formed an intimate acquaintance with our native land. It will also be understood that, though no point of science be more simple or clear than the arrangement of states, according to their separate orders, at a given period, yet it would be alike idle and presumptuous to decide the Arrangement.

precise

preciſe rank of a ſtate in each order; for inſtance, whether France or Ruſſia be the moſt powerful. This part of the arrangement muſt therefore be elective; and it is ſufficient that the ſtates of the ſame order be treated with a ſimilar length of deſcription.

At the beginning of the nineteenth century, the European ſtates comprized in the firſt order are: 1. The united kingdoms of Great Britain and Ireland: 2. France: 3. Ruſſia: 4. The Auſtrian dominions: 5. Thoſe of Pruſſia: 6. Spain: 7. Turkey: which laſt cannot ſo juſtly be reduced to the ſecond order; for though perhaps approaching its fall, ſtill it boaſts the name and weight of an empire.

Under the ſecond order have been arranged: 1. Holland, or the United Provinces: 2. Denmark: 3. Sweden: 4. Portugal: 5. Switzerland. In the third are conſidered the chief ſtates of Germany, that labyrinth of geography, and thoſe of Italy. The kingdoms of Sicily and Sardinia might perhaps, if entire and unſhaken, aſpire to the ſecond order; and an equal ſtation might be claimed by the junctive Electorate Palatine and Bavarian, and by that of Saxony. But as ſuch ſtates only form rather ſuperior diviſions of Germany and Italy, it appeared more adviſeable to conſider them in their natural intimate connexion with theſe countries.

This explanation being premiſed, the firſt deſcription ſhall be that of the Britiſh dominions.

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Nova Zembla
Cape Nord
Cape Finis Terræ
Cape Matapan
Cape Bonifacio
Cape Spartivento
Cape Verde
Cape Gata
Cape Ortegal
Cape Finisterre
Cape Lizard
Cape Clear
Cape Wrath
Cape Ushant
Cape Sicie
Cape Passero
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Cape Cornigliano
Cape Ducato
Cape Sagres
Cape Mondego
Cape Roca

From Arrowsmith's Map of the British Isles.

Lowry sculp.

Published March 27 1804, by Cadell and Davies, Strand, and Longman and Rees, Paternoster Row.

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E N G L A N D.

CHAPTER I.

Historical or Progressive Geography.

Names.—Extent.—Original Population.—Roman, Saxon, and Norman Geography.—Historical Epochs, and Antiquities.

THE Phœnicians, the most ancient enlightened navigators, are generally allowed to have been the first discoverers of the British Islands, and to have transmitted their fame on the page of recorded knowledge. Bochart even supposes that the name of *Britain* originates from a Phœnician word; and another learned writer justly infers, that the name of *Cassiterides*, afterwards restricted to the isles of Scilly, was at first extended to Great Britain and Ireland[1]. This name implies in the Greek language the islands of *tin*; and was probably translated from some corresponding Phœnician term. However this be, the appellations of *Albion* and *Britannia* are afterwards commemorated in Grecian and Roman geography; the first being probably conferred by the Celtic or primeval inhabitants, the latter by the Belgic colonies. But etymological disquisitions are foreign to the present purpose. NAMES.

The southern, most opulent, and most important division of Britain, has, ever since the days of Bede, been distinguished among the European nations by the name of *Anglia*, or England, well known to have ori-

[1] Huet. Hist. du Com. et de la Nav. des Anciens, p. 194. Rennell, Geog. of Herodotus, p. 4.

 ginated

Names. ginated from the Angles, a nation of the Cimbric Cherſoneſe, or modern Jutland, who conquered a conſiderable portion of the country.

Extent. The Iſland of Great Britain extends from fifty to fifty-eight and a half degrees of north latitude, being of courſe about 500 geographical miles in length. Its greateſt breadth from the Land's End to the North Foreland in Kent 320 geographical miles. In Britiſh miles the length may be computed at 580, and the breadth at 370.

Boundaries. England is bounded on the eaſt by the German Ocean; on the ſouth by the Engliſh Channel; on the weſt by St. George's Channel; on the north by the Cheviot Hills, by the paſtoral river Tweed, and an ideal line falling ſouth weſt down to the Firth of Solway. The extent of England and Wales in ſquare miles is computed at 49,450; and the population being eſtimated at 9,500,000, the number of inhabitants to a ſquare mile will of courſe be 192[2].

Original Population. The earlieſt population of this fertile country, which can be traced, is that of the Gael or Southern Celts, called *Guydels* by the Welſh, who regard them as their predeceſſors; and who have juſtly remarked, that the moſt ancient names, even in Wales, are Guydelic, not Cumraig or Welſh[3]. Thoſe Gael appear to have proceeded from the neareſt ſhores of France and Flanders.

As in later times the Belgic ſettlers in this country were ſubdued by the Northern Saxons, ſo the Celtic colony from the ſouth was vanquiſhed by the Cimbri of the North, the anceſtors of the modern Welſh, who ſtyle themſelves Cymri, and their language Cymraig, to this day. The original Gaelic inhabitants appear to have almoſt entirely evacuated the country, and to have retired to Ireland, alſo originally peopled from Gaul. There, and in the Highlands of Scotland, to which a Gaelic colony paſſed from Ireland, the Gaelic dialect of the Celtic language ſtill exiſts.

To the Celtic population of England ſucceeded the Gothic. The Scythians or Goths, advancing from Aſia, drove the Cimbri or northern Celts before them; and, at a period long preceding the Chriſ-

[2] Knox computes Scotland with the Iſles at 27,794, and Ireland at 27,457; France at 141,357 ſquare miles.

[3] Lhuyd Arch. pref.

tian Æra, had seized on that part of Gaul which is nearest to Great Britain, where they acquired the provincial denomination of Belgæ[4]. Their passage to England followed of course: and when Cæsar first explored this island, he informs us, that the primitive inhabitants were driven into the interior parts, while the regions on the south east were peopled with Belgic colonies[5]. Those Belgæ may be justly regarded as the chief ancestors of the English nation; for the Saxons, Angles, and other northern invaders, though of distinguished courage, were inconsiderable in numbers. Till a recent period antiquaries had imagined that the Belgæ used the Celtic language, and had execrated the cruelties of the Saxons for an extirpation which never happened. But as it appears that two thirds of England were possessed by the Belgic Goths, for six or seven centuries before the arrival of the Saxons, it is no wonder that no Celtic words are to be found in the English language, which bears more affinity to the Frisic and Dutch than to the Jutlandic or Danish. NAMES, EXTENT, &c.

Emolliated by four centuries of Roman domination, even the Belgic colonies had forgotten their pristine valour, and were unable to contend with their ferocious invaders from Scotland and Ireland, when chance, or invitation, conducted to their assistance new armies from the continent. The Jutes arrived in the year 449, and founded the kingdom of Kent about the year 460; they also took possession of the Isle of Wight. In 477, the Saxons first appear, and the kingdom of the South Saxons commences at that epoch. The West Saxons arrived in the year 495. The sixth century was considerably advanced, when those barbaric colonies were increased by the East Saxons in the year 527: but the first appearance of the great branch of the Angles, who were to perpetuate their name in the country at large, did not occur till the year 547, when the valiant Ida led his troops to Bernicia. The East Angles taking possession of Norfolk in the year 575, the Southern and Eastern coasts were almost wholly in the power of the invaders, who soon extending their conquests into the interior of the country, founded in the year 585, the kingdom of Mercia, the last of the Heptarchy[6]. Bede pronounces Mercia to have been an Anglic kingdom; and if so, their population may, perhaps, have equalled that of the

[4] Differt. on Goths. [5] Lib. v. c. 10. [6] Beda, Chron. Sax. &c.

NAMES, EXTENT, &c.

Saxons themſelves. Certain it is. that Procopius, a writer of the ſixth century, claſſes the Angli in the firſt rank of the Britiſh nations of his time[7]. We ſhall not ſtop to enquire whether his *Friſones* be the Saxons or the Belgæ. The original documents evince, that all theſe new colonies, while they conquered by ſuperior valour and hardihood, were far from being ſufficiently numerous to form even a ſemblance of population. Scarcely an inſtance occurs of their being accompanied by women; and their invaſions may, in part, be paralleled by the ſubſequent conqueſts of the Danes and Normans. Yet as the period was far more barbarous, the changes were greater; and the Belgic inhabitants, the genuine population, ſeem to have been reduced to various degrees of ſervitude, and to have conſtituted thoſe numerous ſlaves m oned in the Anglo-Saxon times, while intermarriages and other fortunate circumſtances lightened the Norman chain. There ſeems little room to doubt that the Belgæ conſtituted the chief anceſtors of the Engliſh nation, and that their language gradually prevailed, though tinged in the north with the Anglic or Daniſh, and in the ſouth with the Saxon. This ſubject has been the more amply diſcuſſed, becauſe it is not only of eſſential importance in itſelf, but becauſe it has hitherto been clouded with many crude and erroneous aſſertions and opinions.

Progreſſive geography.

The knowledge of the progreſſive geography of any country is indiſpenſably neceſſary for the elucidation of its hiſtory. When the Romans entered Britain, they found the country, like others in the ſavage ſtate, divided among a number of ſmall tribes. With their uſual

Roman.

policy they eſtabliſhed large provinces. *Britannia prima* embraced the whole ſouthern part of England, as far as the Severn and the Thames: *Britannia ſecunda* correſponded to modern Wales. *Flavia Cæſarienſis* extended from the Thames to the Humber, a noble province, receiving its denomination from the imperial houſe of Veſpaſian, and his two ſucceſſors, under whom ſome of the moſt important conqueſts were atchieved. Veſpaſian himſelf was, in the reign of Claudius, the firſt general who began the real conqueſt of Britain[8]. The province of *Maxima Cæſarienſis* reached from the Humber to the Tyne, from

[7] Bell. Goth. lib. iv. c. 20. [8] Tacitus, vita Agricolæ, c. 13.

the

the Merſey to the Solway [9]. In the Roman times about thirty eminent cities, or rather towns, are enumerated, about nine of which are denominated colonies, though none of them could be of much importance; for while the Roman colonies in other countries iſſued abundance of coins, hardly one real coin even of Camulodunum, the moſt important colony, can be pointed out. Our antiquaries indeed have, with erroneous patriotiſm, transferred many Gallic coins, as Britiſh, and have amuſed their readers with many fabricated pieces of antiquity; but real medalliſts, Engliſh as well as foreign, heſitate greatly on the ſubject. A more detailed account of the Roman Geography of England does not fall within the preſent plan, and the curious reader muſt be referred to Horſley and Roy, authors of deſerved eſtimation. NAMES, EXTENT, &c.

The Saxon Geography of England has been partly above indicated; but the following table of the Heptarchy will preſent a more complete idea. SAXON.

1. Kent comprehended the county of Kent.	
2. Suſſex, or the South Saxons.	Suſſex. Surrey.
3. Eaſt Angles,	Norfolk. Suffolk. Cambridgeſhire, with the Iſle of Ely.
4. Weſſex, or the Weſt Saxons,	Cornwall. Devonſhire. Dorſet. Somerſet. Wilts. Hants. Berks.
5. Northumberland,	Lancaſhire. Yorkſhire. Durham. Cumberland. Weſtmoreland. Northumberland, and the parts of Scotland to the Frith of Edinburgh.

[9] Gough's Camden, cxxix. Roy's Map, &c.

6. Eſſex,

NAMES, EXTENT, &c.

6. Eſſex, or the Eaſt Saxons,	Eſſex. Middleſex. Hertfordſhire in part.
7. Mercia,	Glouceſter. Hereford. Warwick. Worceſter. Leiceſter. Rutland. Northampton. Lincoln. Huntingdon. Bedford. Buckingham. Oxford. Stafford. Derby. Salop. Nottingham. The reſt of Hertford [10].

Shires,

Ancient authors affirm, that the great Alfred inſtituted the firſt diviſion of England into SHIRES, ſo denominated from a Saxon word, ſignifying parts cut off, or diviſions. They are alſo denominated COUNTIES, as having been each governed by a diſtinct *Ealdorman*, correſponding with the Latin word *Comes*, or Count; and ſometimes tranſlated *Conſul*, and ſometimes *Comes*, by thoſe Anglo-Saxon authors, who wrote in Latin. After the Daniſh conqueſt, this officer or grandee was known by another appellation, that of *Earl*, from the Daniſh *Iarl;* which, like the word Baron, in its original acceptation, implied ſimply, but by way of great eminence, A MAN. About the eleventh century theſe titles became hereditary dignities; and the government of the ſhire devolved upon the Earl's deputy, the *Vice Comes*, *Shire-reeve*, Sheriff, or manager of the ſhire. A remarkable ſubdiviſion prevails in the extenſive county of York, which was divided into three parts, implied in the Saxon word *Trythings*, now corruptly called Ridings. England and Wales are divided into fifty-two ſhires or counties.

[10] Gough's Camden, cxxxi.

Six

NAMES, EXTENT, &c.

		Number of inhabitants according to the late enumeration.	Chief Towns.
Six northern counties,	Northumberland,	157,101	Newcaſtle.
	Cumberland,	117,230	Carliſle.
	Durham, -	160,361	Durham.
	Yorkſhire, -	563,953	York.
	Weſtmorland,	41,617	Appleby.
	Lancaſhire, -	672,731	Lancaſter.
Four bordering on Wales,	Cheſhire, -	191,751	Cheſter.
	Shropſhire, -	167,639	Shrewſbury.
	Hereforddſhire, -	81,191	Hereford.
	Monmouthſhire,	45,582	Monmouth.
Twelve midland,	Nottinghamſhire,	140,350	Nottingham.
	Derbyſhire, -	161,142	Derby.
	Staffordſhire, -	239,153	Stafford.
	Leiceſterſhire, -	130,081	Leiceſter.
	Rutlandſhire, -	16,356	Okeham.
	Northamptonſhire,	131,7 7	Northampton.
	Warwickſhire, -	208,190	Warwick.
	Worceſterſhire,	139,333	Worceſter.
	Glouceſterſhire,	250,809	Glouceſter.
	Oxfordſhire, -	109,620	Oxford.
	Buckinghamſhire,	107,444	Ayleſbury.
	Bedfordſhire, -	63,393	Bedford.
Eight eaſtern,	Lincolnſhire, -	208,557	Lincoln.
	Huntingdonſhire,	37,568	Huntingdon.
	Cambridgeſhire,	89,346	Cambridge.
	Norfolk, -	273,371	Norwich.
	Suffolk, -	210,431	Ipſwich.
	Eſſex, -	226,437	Chelmsford.
	Hertfordſhire, -	97,577	Hertford.
	Middleſex*, -	535,329	London.
Three ſouthern,	Surry, -	269,043	Guilford.
	Kent, - -	307,624	Maidſtone.
	Suſſex, -	159,311	Lewes.

* Excluſive of the capital.

Four

Names, extent, &c.		Number of inhabitants according to the late enumeration.	Chief Towns.
Four southern,	Berkshire,	109,215	Reading.
	Wiltshire,	185,107	Salisbury.
	Hampshire,	219,656	Winchester.
	Dorsetshire,	115,319	Dorchester.
Three south-western,	Somersetshire,	273,750	Taunton.
	Devonshire,	343,001	Exeter.
	Cornwall,	188,269	Launceston.
Six, North Wales,	Flintshire,	39,622	Flint.
	Denbighshire,	60,352	Denbigh.
	Caernarvonshire,	41,521	Caernarvon.
	Anglesey,	33,806	Beaumaris.
	Merionethshire,	29,506	Bala.
	Montgomeryshire,	47,978	Montgomery.
Six, South Wales,	Radnorshire,	19,050	Presteign.
	Cardiganshire,	42,956	Cardigan.
	Pembrokeshire,	56,280	Pembroke.
	Caermarthenshire,	67,317	Caermarthen.
	Brecknockshire,	33,633	Brecknock.
	Glamorganshire,	71,525	Caerdiff.

It is also generally believed that Alfred was the author of the subdivisions of counties, called hundreds and tythings, now seldom mentioned except in legal proceedings, and in topographical descriptions. It is probable that the hundred originally contained one hundred manors, or rather farms; while the tything was restricted to ten. Such are the chief features of the Saxon geography of England. The capitals of the several Heptarchic kingdoms varied at the will of the Sovereign. London which belonged to the East Saxons, maintained in some degree its Roman fame and eminence; but on the termination of the Heptarchy, Winchester was regarded as the capital of England. Further illustrations will arise under the head of Ecclesiastical Geography.

It must not however be forgotten, that the kingdom of Northumbria, comprizing the regions north of the Humber, existed till the year 950, under its peculiar Sovereigns, the last of whom was Eric: and that even Domesday Book, which was compiled in the time of William

the Conqueror, excludes the three counties of modern Northumberland, Cumberland, and Weſtmorland, then regarded as part of Scotland. Durham, the patrimony of St. Cuthbert, a province of eccleſiaſtic, not ſecular juriſdiction, is alſo admitted; and Lancaſhire is arranged under the diviſions of Yorkſhire and Cheſhire. The kingdom of Bernicia at one period extended to the Frith of Forth; but in the latter Saxon times the boundaries of England on the north fell conſiderably ſhort of their preſent extent. On the weſt, Offa king of Mercia reſtricted the Welſh by an extenſive barrier, the remains of which are ſtill called Offa's dyke [11]. It extended from the river Wye, along the counties of Hereford and Radnor into that of Montgomery, where it enters North Wales. It afterwards paſſes by Chirk Caſtle to the river Dee, and ends in the pariſh of Mold. Names, extent, &c.

Few alterations of any conſequence appear in the Geography of England in the Norman period. The northern limits were however extended to their preſent circuit. Cumberland and Weſtmorland were wreſted from the Scots, and the provinces north of the Humber were completely incorporated. On the weſt, Henry I, about the year 1120, having conquered a part of Wales, invited and eſtabliſhed a Flemiſh colony [12] in Pembrokeſhire, and one or two others of the moſt ſouthern counties, which afterwards became remarkable for induſtry; a ſingular fact in modern hiſtory, though not unuſual in ancient times, and for that period a remarkable ſtretch of political wiſdom. The ſubſequent conqueſt of Wales by Edward I, and its gradual aſſimilation and aſſociation with England are ſufficiently known. Normans.

Geography has been ſtyled one of the eyes of hiſtory, a ſubſervience to which ſtudy is undoubtedly one of its grand objects; but it would, at the ſame time, be foreign to its nature to render it a vehicle of hiſtory. The proper and peculiar ſubjects of geographical ſcience are ſo ample, and often attended with ſuch difficult reſearch, that it becomes equally raſh and unneceſſary to wander out of its appropriated domain. In this work therefore it is only propoſed briefly to mention the grand hiſtorical epochs of nations; and thoſe events which have altered their boundaries and geographical relations. Hiſtorical epochs.

[11] Pennant's Wales, vol. i. p. 273. [12] Will. Malmſb. lib. v.

 The

Historical Epochs.

The population of England by the Celts may be regarded as the first historical epoch.

The second is formed by the Belgic colonies; who, perhaps about three centuries before the Christian æra, seized the southern and eastern shores, and advancing by degrees restricted the Celts to the west. The Belgic colonization of England is important in many points of view, as establishing the primitive germ of the present English nation, and as introducing agriculture, which was not practised by the hunting and pastoral tribes of the Celts [13]: nor is it improbable that some of the fertile districts of England have known cultivation for the space of two thousand years.

3. Under Julius Cæsar the Romans can only be said to have explored this island; and near a century elapsed before the real conquest was commenced by Claudius; between whose reign and that of Domitian, the Roman Eagle had been displayed as far as the Grampian mountains. The fertility of the soil, and the Roman arts of civilization, softened the spirit even of the Belgic Britons, and inured them to docile servitude. Carausius and other chiefs seized the British purple, and availed themselves of the strong maritime barrier to bid defiance to the Cæsars; but their troops, and their mariners, had the name of Romans; and these were merely schisms of a vast empire, not assertions of native independence. The Britons on the contrary were afterwards forced to implore the assistance of the Romans against their few, but ferocious invaders.

4. After a duration of four centuries, the Roman domination yielded to that of the Saxons and Angles, nations congenerous with the Belgæ. This revolution has indelibly impressed the name, character, language, laws, manners, and customs of the people.

5. After repeated ravages in the preceding centuries, the Danes in the year 1016, dispersed the armed force of England, and gave three Kings to the country, Canute, Harold, and Hardicanute; but the dominion returned to the Saxon line in the year 1042.

6. On the death of Edward the Confessor, what is called the conquest of England took place in 1066, under William the Norman. As

[13] Cæsar, lib. v. c. 10.

the Normans, or Norwegians, had been ſettled in the north of France for a long time, they introduced the French language among people of rank, and even into legal procedure; a ſervile badge not even hitherto abſolutely eradicated, though the motive muſt be applauded, as the property and perſonal ſecurity of ſucceſſive generations are ſo intimately connected with the immutability of the national juriſprudence. Historical Epochs.

7. The great charter granted by John at Runnymede is deſervedly eſteemed a memorable epoch of Engliſh freedom.

8. The civil wars between the houſes of York and Lancaſter may be regarded as the next remarkable epoch. Though deſtructive of literature and the arts, they proved the perdition of a ferocious ariſtocracy; and thus eſtabliſhed by degrees the third balance of the Britiſh conſtitution in the Houſe of Commons.

9. The reformation, by delivering the nation from the heavy yoke of ſuperſtition, increaſed the national energies, and imparted freedom of thought, and a ſpirit of independence, to the individual character.

10. The civil wars under Charles I, had the uſual effect of impeding the courſe of literature and the arts; but by the violent changes and conſequences, and the exceſſes committed on both ſides, ſuperinduced from experience, the only teacher of practical wiſdom, a ſpirit of mutual forbearance and toleration; ſo that the ſubſequent revolutions have, to the eternal honour of the national character, been effected almoſt without bloodſhed, and by the mere weight of national will and experience.

11. The revolution under William III, and the laws enacted upon that occaſion, by the unchangeable eſtabliſhment of the proteſtant religion, and many more minute emanations of freedom, ſtill further contributed to national and individual independence; of which the acceſſion of the Houſe of Hanover conſtituted an additional pledge and confirmation.

12. The war with the American colonies forms not only an epoch of ſingular novelty, but of the moſt important conſequences. It perhaps preſented the firſt inſtance, in modern hiſtory, of a conflict between the parent ſtate and its colonies. It was little diſgraced with the atrocities of a civil war; and after a manly ſtruggle was terminated with gentleneſs and moderation. The Americans broke their colonial bonds,

Historical Epochs.

but could not overcome their commercial, which muſt bind them to the parent ſtate for ſome generations, if they do not even deſtroy their vaunted independence. The conſequences of this revolution to the whole human race are incalculable; whatever they may be, an Engliſhman may well exult that his brethren have commenced a large empire in a new hemiſphere, and may hope and wiſh that Aſia and Africa may alſo be animated by the Engliſh character, which even envy muſt allow is inferior to none in the ſpirit of intelligence and improvement, in benevolence and integrity, and in rational and practical freedom.

Antiquities.

The ancient monuments of a country are intimately connected with the chief epochs of its hiſtory, and particularly with the revolutions it has undergone by foreign conqueſt, or new population. The Engliſh antiquities fall of courſe into ſix diviſions. 1. Thoſe belonging to the primitive Celtic inhabitants. 2. Thoſe of the Belgic colonies. 3. Thoſe of the Romans. 4. Thoſe of the Saxons. 5. Relics of the Danes. 6. Norman monuments. Few of thoſe remains, it muſt be confeſſed, throw much light upon hiſtory; but many of them being intereſting and curious in themſelves, they deſerve the attention of the traveller and geographer.

Belgic.

A radical miſtake in the ſtudy of Engliſh antiquities has ariſen from the confuſion of the Celtic and Belgic languages and monuments. The Druids have deſervedly attracted much curioſity and reſearch; but it would be erroneous to impute to them, as is uſual, the whole of our earlieſt remains. Cæſar ſpeaks of Druidiſm as a recent inſtitution; and ſuch being the caſe, it is probable that it originated from the Phœnician factories, eſtabliſhed in wooden fortreſſes on the coaſt, the uſual practice of commercial nations, when trading with ſavage or barbarous races. The tenets correſpond with what little exiſts of Phœnician mythology, and the miſſionaries of that refined people might be not a little zealous in their diffuſion. However this be, the ancient authors, from whom we derive our ſole authentic information concerning the Druids, minutely deſcribe their religious rites, but are totally ſilent concerning any monuments of ſtone being uſed among them. On the contrary, they mention gloomy groves, and ſpreading oaks, as the only ſcenes of the Druidic ceremonies. Yet our antiquaries will even infer,

infer, that Stonehenge is a Druidic monument, though it be ſituated in an extenſive plain, where not a veſtige of wood appears, and where the very ſoil is reputed adverſe to its vegetation. ANTIQUITIES

It might, perhaps, be a vain effort of antiquarian inveſtigation, to attempt to diſcriminate the remains of the earlieſt inhabitants from thoſe of the Druidic period; indeed, if we ſet aſide the authorities of modern antiquaries, commonly viſionary and diſcordant, there is no foundation whatever for any ſound or real knowledge of the ſubject. The following have been eſteemed druid monuments by Borlaſe: 1. Single ſtones erect: 2. Rock idols and pierced ſtones: 3. Rocking-ſtones uſed as ordeals: 4. Sepulchres of two, three, or more ſtones: 5. Circular temples, or rather circles of erect ſtones: 6. Barrows or tumuli: 7. Cromlechs, or heaps of ſtones: 8. Rock-baſons, imagined to have been uſed in Druidic expiations: 9. Caves, uſed as places of retreat in time of war [14]. But as moſt of thoſe relics may alſo be found in Germany and Scandinavia, it becomes hazardous to pronounce whether they be Gothic or Celtic; and, as we learn from ancient authors that the Germans had no Druids, to beſtow the name of Druidic, upon ſuch monuments, is the mere wantonneſs of conjecture. It is, however, moſt probable, that the earlieſt inhabitants, as is ever the practice in the infancy of ſociey, made uſe of wood, not ſtone, in their religious as well as in their domeſtic erections. If we ſurvey the various ſavage regions of the globe, we ſhall ſeldom or never perceive the uſe of ſtone; and it is certainly juſt to infer, that the ſavages of the Weſt, were not more ſkilful than thoſe of the Eaſt; nor thoſe of the old continents and iſlands, than thoſe of the new. However this be, a learned ignorance upon ſuch topics, is preferable to an aſſumed and imaginary knowledge.

But as many of theſe monuments are found in Germany, Scandinavia, and Iceland; and as the Icelandic writers in particular, often indicate their origin and uſe, which are unknown in the Celtic records, there is every reaſon to attribute them to a more advanced ſtage of ſociety, when the Belgic colonies introduced agriculture, and a little further progreſs in the rude arts of barbariſm. The nature of this

[14] See Enquiry into Hiſt. of Scotl. vol. i. p. 409.

work

ANTIQUITIES.

work will not admit a formal inveſtigation of ſuch topics, but a few remarks may be offered on Stonehenge, a ſtupendous monument of barbaric induſtry. Inigo Jones in attempting to prove that it is Roman, only evinces that no talents can avail when ſcience is wanting, and that antiquities require a ſevere and peculiar train of ſtudy. Doctor Stukeley, a viſionary writer, aſſigns Stonehenge to the Druids; while Dr. Charlton perceiving that ſuch monuments are found in Denmark, aſcribed it to the Danes. If the latter had conſidered that the Belgæ were a gothic nation of ſimilar language and inſtitutions, he might with more juſtice have extended its antiquity. From the Icelandic writers[15] we learn, that ſuch circles were called *Domb-ringr*, that is literally *Doom-ring*, or circle of judgment, being the ſolemn places where courts were held, of all kinds and dignities, from the national council down to the baronial court, or that of a common proprietor of land, for adjuſting diſputes between his *villani* and ſlaves. The magnificence of Stonehenge loudly pronounces that it was the ſupreme court of the nation, equivalent to the *Champs de Mars et de Mai* of the Franks, where the king and chiefs aſſembled in the circle, and the men capable of arms in the open plain; nor is it improbable that the chiefs aſcended the tranſverſe ſtones, and declared their reſolves to the ſurrounding crowd, who, in the deſcription of Tacitus, diſſented by loud murmurs, or applauded by claſhing their ſhields[16]. This idea receives confirmation from the circumſtance that the Belgæ peculiarly ſo called, as being the chief and ruling colony of that people, were ſeated in the ſurrounding province, and *Sorbiodunum*, now Old Sarum, was their capital city.

Similar circles of ſtone, but far inferior in ſize, are found in many parts of Great Britain and Ireland; and ſeveral undoubtedly as late as the Daniſh inroads and uſurpations, the practice being continued by that people at leaſt till their converſion to chriſtianity, in the tenth and eleventh centuries. Some of the ſmalleſt, as we learn from the northern antiquaries, were merely places of family ſepulture. At a later period the circles of judgment, which had been polluted with human ſacrifices, and other pagan rites, were abandoned; and the

[15] Landnama Saga, &c. &c. [16] Germ. xi. Hiſt. v. 17.

great

great courts were held on what were called *Moot-hills*, or hills of meeting, many of which ſtill exiſt in the Britiſh dominions, and in the Netherlands. They commonly conſiſt of a central eminence, on which ſat the judge and his aſſiſtants; beneath was an elevated platform for the parties their friends, and *conpurgators*, who ſometimes amounted to a hundred or more; and this platform was ſurrounded with a trench to ſecure it from the acceſs of the mere ſpectators. Of the other monuments of this period, a more brief conſideration muſt ſuffice. When a monarch, or diſtinguiſhed general, was buried, a barrow or hillock was erected to preſerve his name and memory to future ages: the ſize depending on the reputation of the perſon, which attracted a ſmaller or larger number of operators. Such monuments are very ancient, and even to this day denote the ſepulchres of ſome of the heroes of the Trojan war[17]. In later times a large ſingle ſtone erected was eſteemed a ſufficient memorial: ſuch ſingle ſtones alſo ſometimes appear as monuments of remarkable battles, or merely as boundaries. The caves are familiar to moſt nations in an early ſtate of ſociety. ANTIQUITIES.

The Belgic relics are followed by thoſe of the Romans, which are moſtly objects of mere curioſity, and rarely throw the ſmalleſt light upon the page of hiſtory. Amphitheatres are ſaid to be ſtill viſible at Silcheſter, in Hampſhire, and ſome other places. The Roman caſtle at Richborough, the ancient Rutupiæ in Kent, preſents conſiderable remains of a maſſy wall cemented with ſurpriſing firmneſs. The Roman ruins in this country are commonly compoſed of ſtone or flint, with ſtrata of flat bricks at conſiderable intervals. The moſaic pavements, hypocauſts, &c. are generally the remains of the villas of opulent Romans, ſcattered over the country. The greateſt number of Roman inſcriptions, altars, &c. has been found in the North, along the great frontier wall, which extended from the Weſtern Sea, to the eſtuary of Tyne. This vaſt wall is juſtly eſteemed the moſt important remain of the Roman power in England, as that of Antoninus is in Scotland. The extent was about 70 miles, and its conſtruction, forts, &c, have been illuſtrated by the labour of ſeveral antiquaries. Roman.

[17] Chevalier, Dallaway, and Morritt.

Numerous

Antiquities.

Numerous are the more minute relics of the Romans in England, as coins, gems, weapons, ornaments, and the like; among which, however, the ſilver diſh belonging to the Duke of Northumberland, deſerves eſpecial mention. One of the grand cauſes of the civilization, introduced by that ruling people into the conquered ſtates, was the highways, which form, indeed, the firſt germ of national induſtry, and without which neither commerce nor ſociety can make any conſiderable progreſs. Conſcious of this truth, the Romans ſeem to have lent particular attention to the conſtruction of roads in the diſtant provinces; and thoſe of England, which may ſtill be traced in various ramifications, preſent à laſting monument of the juſtice of their conceptions, the extent of their views, and the utility of their power. A grand trunk, as it may be called, to anticipate the language of our inland navigations, paſſed from the South to the North, and another to the Weſt, with branches in almoſt every direction that general convenience and expedition could require. What is called the Watling-ſtreet, led from Richborough, in Kent, the ancient Rutupiæ, N. W. through London to Cheſter. The Ermin-ſtreet paſſed from London to Lincoln, thence to Carliſle, and into Scotland, the name being ſuppoſed to be corrupted from *Herman*, which means warrior, as the chief wars lay in the North. The Foſſe Way is ſuppoſed to have led from Bath and the weſtern regions, N. E. till it joined the Ermin-ſtreet. The laſt celebrated road was the Ikenild, or Ikneld, ſuppoſed to have extended from near Norwich, S. W. into Dorſetſhire [10].

Saxon.

The Saxon antiquities in England are chiefly edifices, ſacred or ſecular; many churches remain which were altogether, or for the moſt part, conſtructed in the Saxon period; and ſome are extant of the tenth, or perhaps the ninth, century. The vaults erected by Grimbald, at Oxford, in the reign of Alfred, are juſtly eſteemed curious relics of Saxon architecture. Mr. King has ably illuſtrated the remains of the Saxon caſtles. The oldeſt ſeem to conſiſt of one ſolitary tower, ſquare or hexagonal: one of the rudeſt ſpecimens is Coningſburg Caſtle, in Yorkſhire; but as that region was ſubject to the Danes, till the middle of the tenth century, it is probably Daniſh. Among the

[10] Gough's Britiſh Topography, I. 10.

ſmaller

ſmaller remains of Saxon art, may be mentioned the ſhrines for preſerving relics, which ſome ſuppoſe to preſent the diminutive rudiments of what is ſtyled the Gothic architecture; and the illuminated manuſcripts which often afford curious memorials of the ſtate of manners and knowledge. ANTIQUITIES.

The Daniſh power in England, though of conſiderable duration in the North, was in the South brief and tranſitory. The camps of that nation were circular, like thoſe of the Belgæ and Saxons, while thoſe of Roman armies are known by the ſquare form: and it is believed that the only diſtinct relics of the Danes, are ſome caſtles to the north of the Humber, and a few ſtones with Runic inſcriptions. Daniſh.

The monuments ſtyled Norman, rather to diſtinguiſh their epoch than from any information that Norman architects were employed, are reputed to commence after the conqueſt, and to extend to the fourteenth century; when what is called the rich Gothic began to appear, which, in the ſixteenth century, was ſupplanted by the mixed; and this in its turn yielded to the Grecian. In general the Norman ſtyle far exceeds the Saxon in the ſize of the edifices, and the decoration of the parts. The churches become more extenſive and lofty, and though the windows retain the circular arch, they are larger and more diverſified; the circular doors are feſtooned with more freedom and elegance; and uncouth animals begin to yield to wreaths of leaves and flowers. The ſolitary keep, or tower, of the Saxon caſtle, is ſurrounded with a double wall, incloſing courts and dwellings of large extent, defended by turrets and double ditches, with a ſeparate watch-tower, called the Barbican. Among others the Cathedrals of Durham and Wincheſter, may be mentioned as venerable monuments of Anglo-Norman architecture; and the caſtles are numerous and well known. What is called the Gothic, or pointed arch, is generally ſuppoſed to have firſt appeared in the thirteenth century; and in the next it became univerſal in religious edifices. The windows diffuſed to great breadth and loftineſs, and divided into branching interſtices, enriched with painted glaſs, the cluſtering pillars of exceſſive height, ſpreading Norman. Rich Gothic.

 into

ANTIQUITIES.

into various fret-work on the roof, conſtitute, with decorations of ſmaller note, what is called the rich Gothic ſtyle, viſible in the chapel of King's College, at Cambridge, and many other grand ſpecimens in this kingdom. The ſpire correſponds with the interior; and begins about the thirteenth century, to riſe boldly from the ancient tower, and diminiſh from the ſight in a gradation of pinnacles and ornaments.

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From the various Surveys of England.

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CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastic Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

THE church of England is eſtabliſhed upon a moſt peculiar baſis, and truly characteriſtic of a moderate and judicious nation. As in the political ſyſtem, extremes, the uſual concomitants of inexperience, are carefully avoided, and deſpotiſm or anarchy, from whatever ſource, monarch, nobles, or people, prevented, as far as human wiſdom can deviſe; ſo in the church, while the papal power, and other catholic chains are proſcribed, the other extremes, tending to looſe democracy, are equally avoided. It is the only reformed church which has retained the epiſcopal form in its ancient ſplendour; for though Biſhops may alſo be found in Denmark, Sweden, Norway, &c. they are rather inſpectors of the conduct of the clergy, and of the modes of education, than prelates endowed with ſenatorial rank and dignity. In England, on the contrary, the biſhops are peers of parliament, and have the ſtyle and importance of nobility. Yet the creed of the Engliſh church is rather Calviniſtic than Lutheran. But the ſpecial tenets of the Engliſh church are ſufficiently explained in the thirty-nine articles; and a brief idea of its government will be more pertinent to the preſent purpoſe. Religion.

The orders of biſhops, prieſts, and deacons, compoſe the body of the clergy. Upon his diſpute with the Pontiff, to avoid any claims whatever of ſuperiority, Henry VIII ſeized the title of Supreme Head of the National Church, and iſſued ſeveral medallions with inſcriptions in Hebrew, Greek and Latin, to commemorate this new prerogative, which is, indeed, important, as it blends the eccleſiaſtic with the civil adminiſtration. Next in dignity and power are the Archbiſhops of Church of England.

Church. Canterbury and York. The firſt is ſtyled Primate of all England, and precedes all perſons, except the Royal family. He has the power of probate of all teſtaments within his province, and of granting ſeveral diſpenſations concerning benefices: he has, alſo, four courts of judicature, that of Arches, of Audience, of Prerogative, and of Peculiars. The Archbiſhop of York is ſtyled Primate of England, but in prerogative, and juriſdiction yields greatly to the firſt Metropolitan[1]. The Archbiſhopric of York extends over the counties of Northumberland, Durham, Cumberland, Weſtmorland, Cheſhire, Lancaſhire, and the Iſle of Man, beſides its proper and peculiar dioceſe, of the greateſt part of Yorkſhire and Nottinghamſhire. That of Canterbury compriſes the other counties; and has its peculiar dioceſe, being a great part of Kent. The archiepiſcopal office is rather a dignity than a juriſdiction, and the primates rarely interfere in any dioceſes except their own. They are appointed by the king, in the ſame manner as the biſhops, by what is called a *Congé d'Elire*.

Biſhops. Upon any vacancy in an epiſcopal ſee, the dean and chapter apply to the king, who returns a *Congé d'Elire*, naming the perſon to be choſen[2]. A chapter of the prebendaries is then ſummoned by the dean, and they are conſtrained under the penalty of a *præmunire* to elect the perſon nominated. The ſolemnity is completed by the royal aſſent, under the great ſeal, and by the confirmation and conſecration, performed by the metropolitan, or in his name. The prelate afterwards pays homage to the king for his temporalities, or the baronies connected with the ſee; and compounds for the firſt fruits, that is the revenue of the firſt year, which is paid to the corporation for increaſing the benefices of the poor clergy. The omiſſion of conſecration is the only difference when a biſhop is tranſlated to another ſee; and when an archbiſhop is nominated, the king appoints four or more biſhops to officiate at the confirmation.

The biſhop alone may ordain deacons and prieſts, dedicate churches and burial grounds, and adminiſter confirmation[3]. In former times

[1] Chamberlayne, p. 3. 38th edit. 1755, 2 vol. 8vo.
[2] Chamberl. 140. Blackſtone, b. i. c. 11. [3] Chamberl. p. 65.

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episcopal jurisdiction extended to the licensing of physicians, surgeons, and schoolmasters, and to the conjunction of small parishes. At present it chiefly embraces questions of births, marriages, deaths, and testaments, and any delinquencies of the clergy; to which body, indeed, their attention is now chiefly confined, and they rarely, except in parliament, interfere in secular subjects. The Bishop of Sodor and Man has no place in parliament. All the other bishops are barons, and peers of the realm, by three different claims; in right of the baronies attached to their sees, as barons summoned by writ, and as barons by patent, a form which accompanies their consecration[4]. Their privileges approach the regal; they are the sole judges in their own courts, and issue writs in their own names, not in the royal style used by other courts. They can depute their authority, which no other judge can; and their episcopal power of conferring orders, &c. may be exerted in any christian country, while lay peers are only acknowledged in the country whence they derive their dignities[5]. To pass other more minute privileges, the Bishop of London, as presiding over the capital, has the precedence of all the others. The see of Durham constitutes a county palatine, with great powers and prerogatives: the authority and patronage of the bishop are of course very extensive, and even the king's judges only sit in his diocese by his permission. The Bishop of Winchester is the third in dignity, but esteemed the first in opulence, as the large civil list of Durham, while it adds power, diminishes revenue. These three bishops precede all the rest, who take place according to the seniority of consecration.

Prebendaries, &c.

To every cathedral in England belong several prebendaries as canons, and a dean, so styled as is said, (*Decanus*,) because he anciently presided over ten canons[6]. In the old quaint language he was called one of the bishop's eyes, while the archdeacon, who had charge of the deacons, was reputed the other. The dean and the chapter of prebendaries assist the bishop in ecclesiastic affairs. The prebendaries are so styled from the prebend, or *pars præbenda*, portion of land or income allotted to them; and with the dean form a body, college, or corporation; and

[4] Chamberl. 67. Blackstone, b. i. c. 11. [5] Chamberl. 68. [6] Ibid. 69.

they

CHURCH. they have ſeveral privileges ſuperior to the common or minor canons. At the reformation their ſalaries were moſtly converted into money, but thoſe of Durham preferred the antient portions of land, which having prodigiouſly increaſed in value, they are now ſtiled golden prebends, being worth from 800*l.* to 1200*l.* a year, while the biſhop, out of 9000*l.* a year, has to ſupport a great and unavoidable expenditure.

Archdeacons. The next order is that of the Arch-deacons, amounting in all to about ſixty; their office is to inſpect the moveables of the churches, to reform ſlight abuſes, and to induct into benefices. Arch-prieſts, who, on the Continent, ſhare the labours of the arch-deacon, on a ſmaller ſcale, being ſuperintendents over a few pariſhes, were in England alſo ſtyled rural deans, but are now unknown. Subdiviſions of government are ſo much controuled by the very nature of human affairs, that the power of the arch-prieſt almoſt correſponded with the Scottiſh preſbytery, while the provincial ſynods are ſimilar to biſhopricks.

Clergy. Of the clergy in general, the loweſt order is that of deacons, whoſe office formerly was to ſuperintend the poor; the ancient donations to the church being always aſſigned in three diviſions, one to the poor, another for repairs, and the laſt for the clergy. At preſent the deacon's office is reſtricted to baptiſm, to reading in the church, and aſſiſting the prieſt at the communion, by handing the cup only. Deacon's orders cannot be canonically received before the age of twenty-three years, thoſe of a prieſt require twenty-four, and a biſhop muſt be thirty.

Curate. The curate is a clergyman appointed to officiate for another, and is ſo named from his having the care of ſouls; hence the French rather apply the term to the rector. If the predial, or great tythes of the pariſh, be impropriated, or converted into ſecular hands, the prieſt is termed a vicar, a name originally implying that they were the *vicarii*, or deputies of the rector; but if the tythes be entire the prieſt is ſtyled rector. The churchwardens ſuperintend the repairs and decorations of the church, and the requiſites for divine ſervice, and collect the alms of the pariſhioners; they are annually elected at Eaſter, and have ſome-

Vicar.

Rector.

Churchwardens.

ſometimes ſideſmen, a kind of aſſiſtants. The ſacriſtain, corruptly called ſexton, originally had the care of the furniture and plate of the church; and by a ſtill greater corruption, the appellation is now applied to the grave-digger, when it ought to have been conferred on the pariſh-clerk. Church.

The clergy in general enjoy ſome peculiar privileges. Their goods are free from tolls in fairs and markets: they cannot be compelled to any office, civil or military: they are only amerced according to their temporal eſtate: nor are they aſſeſſed for a robbery committed in the hundred, or for watching, warding, high-ways, &c. &c.

Eccleſiaſtical courts ſtill retain conſiderable power: the convocation, conſiſting of the archbiſhops and biſhops, with a lower houſe of 150 members, only meets for the ſake of form; but have not been allowed to deliberate ſince the reign of Anne[7]. Convocations.

Next in dignity is the court of delegates, acting by a ſpecial commiſſion under the great ſeal; and to whom an appeal lies from the highest metropolitan court. The court of arches is ſo ſtyled, becauſe it was held in the arches of the church of St. Mary-le-bowe, London, but now in the great hall, Doctors Commons; only doctors of the civil law are allowed to plead[8]. The court of audience is always preſided by the archbiſhop himſelf, who decides any doubts concerning the admiſſion to benefices, and diſpenſation of the bans of matrimony. Courts.

The next court is that of Prerogative, which judges of eſtates fallen by will, or inteſtate; the prerogative-office is likewiſe in Doctors Commons. The court of Peculiars refers to ſeveral peculiar pariſhes, exempt from the juriſdiction of the biſhops, but here amenable: the judges are ſole and without jury.

[7] Chamberl. 70, 1. 76. Gough's Cam. i. 147. Blackſtone, p. 111. c. v.

[8] The degrees are only taken at the Univerſities, yet they chiefly practiſe in London, a college being purchaſed for their uſe, by Dr. Henry Hervey, where they communed together in a collegiate manner; whence the name of Doctors Commons, more properly called the College of Civilians, near St. Paul's, which being conſumed in the fire of London, was rebuilt in 1672. The Procurators, or Proctors, of theſe courts, are admitted by the Archbiſhop's mandate, acting as the Solicitors in other courts.

The

Ecclesiastical Geography.

The ecclesiastical geography of England may be seen in the following table:

Province of Canterbury.

1. Bishoprick of London, containing Essex, Middlesex, and part of Hertford.

2. Winchester.—Surry, Hampshire, Isles of Wight, Jersey, Guernsey, and Alderney.

3. Litchfield and Coventry.—Stafford, Derby, and part of Warwick and Shropshire.

4. Lincoln.—Lincoln, Leicester, Huntingdon, Bedford, Buckingham, and part of Hertford.

5. Ely.—Cambridgeshire.

6. Salisbury.—Wilts and Berkshire.

7. Exeter.—Cornwal and Devon.

8. Bath and Wells.—Somersetshire.

9. Chichester.—Sussex.

10. Norwich.—Norfolk, Suffolk, and a small part of Cambridge.

11. Worcester.—Worcester, and part of Warwick.

12. Hereford.—Hereford, and part of Shropshire.

13. Rochester.—Part of Kent.

14. Oxford.—Oxfordshire.

15. Peterborough.—Northampton and Rutland.

16. Gloucester.—Gloucestershire.

17. Bristol.—The City of Bristol, part of Gloucestershire, and County of Dorset.

18. Landaff.—Glamorgan, Monmouth, Brecknock, and Radnor.

19. St. David's.—Pembroke, Cardigan, and Caermarthen.

20. St. Asaph.—The greatest part of Flint, Denbigh, and Montgomery, and some part of Shropshire.

21. Bangor.—The counties of Anglesey, Caernarvon, Merioneth, and part of Denbigh and Montgomery.

Province of York.

22. Durham.—Durham and Northumberland.

23. Carlisle.—Great part of Cumberland and Westmorland.

24. Chester.

24. Chester.—Cheshire, Lancashire, Richmondshire (which is part of York); with part of Cumberland and Westmorland. CHURCH.

25. Isle of Man.

The valuations in the king's books are omitted, because even the comparative valuation would lead to ideas wholly erroneous. Several changes have taken place in the number and situations of the bishopricks since Christianity was first established in this country, but these rather belong to the province of the antiquary.

Those who differ in tenets or forms from the established church may, in general, be styled Dissenters, though the term be more strictly applied to the Presbyterians and Independents. The other principal classes of dissidents, are the Papists, Methodists, Quakers, the Anabaptists, the Swedenborgians, and the Unitarians; the last class denying the Trinity, and believing only in one God, is now intermingled with the two first, who have considerably relaxed the strictness of their discipline. The Independents assert, that each congregation has a right to regulate itself, while the Presbyterians unite churches under various divisions, provincial and national. The clerical aristocracy of the Presbyterians was obtruded with great haughtiness upon the English nation, during the civil war in the last century, and was rendered the more odious, because it admitted no toleration: hence the English found that they had only exchanged one yoke for another, or rather ease for slavery, as ten presbyters amounted to one bishop, and superadded the petulance and morosenes of individual inquisitors. Milton, and other friends of freedom, soon began to satirise the whole sect, and to fly for refuge to the Independents, whose benevolence or address granted universal toleration. To this body Cromwel lent an iron hand; and, after annihilating the presbyterian power in England, in a great measure subverted that of Scotland. The intolerant spirit of the presbyterians originated with their apostle Calvin, whose cruelty to Servetus was balanced by surprising talents in clerical polity; it rendered their power singularly adverse to letters and taste, and no man of science who has studied the literary history of this country, would wish for the revival of such domination. But at present Calvin would not recognize his disciples, as they have abandoned their polemical thistles,

 and

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and cultivate the moſt elegant productions of the literary field. The papiſts uſed chiefly to abound in Lancaſhire, Staffordſhire, and Suſſex; they had potent chiefs, and were a formidable body; but the paſſage from ſuperſtition to contempt is ſo natural, that many have fled to the oppoſite extreme. Thoſe who retain their faith, generally diſplay moderation, which has been naturally increaſed by the late privileges extended to them.

The methodiſts are extremely numerous and reſpectable. They ſeem to allow the propriety of the creed and government of the church of England; but they require a more ſtrict life, more fervent devotion, and more frequent and ſerious attendance upon divine worſhip, than is enforced by the eſtabliſhment. A philoſopher may well envy the mild creed, and univerſal charity, or fraternal love of the quakers; while he muſt allow with a ſigh, that a nation of quakers could not exiſt, except all nations were of the ſame perſuaſion. The anabaptiſts diſown infant baptiſm and bathe the adult diſciple. The learned Whiſton admired their tenets, and their practice of anointing the ſick with oil, which, as he believed, operated with miraculous power. The Swedenborgians derive their name from the Baron Swedenborg, a nobleman who exchanged his native country of Sweden, for a reſidence in England. After having publiſhed two folio volumes in the Latin language, upon the art of exploring mines, he was ſeized with a violent fever, and with great difficulty recovered. In his diſordered imagination he ſeemed to maintain a frequent intercourſe with the ſpiritual world; and he has publiſhed twenty or more vaſt volumes in quarto, alſo in the Latin tongue, replete with curious metaphyſical ratiocination, interſperſed with viſions which are ſometimes narrated with high poetical ſpirit and elegance. His ſyſtem is ſo much adapted to the ſtrongeſt propenſities of human nature, that his diſciples increaſed with great rapidity. His chief tenets are, that there is but one perſon of the Deity, namely, the Lord Jeſus Chriſt, that the day of judgment is already paſſed, &c. &c. but his moſt alluring tenets partake of Mahometaniſm, in repreſenting the connubial pleaſures, and the other enjoyments of a future world, which he paints as ſimilar to this ſtate of

existence, but far exceeding it in the gratifications of every sense, whether mental or corporeal. GOVERNMENT.

The constitution of England, the peculiar boast and glory of the country, and an object of admiration to other states, though attempted to be described by Montesquieu, has been little understood by foreigners, for it presents such an infinite number of practical ramifications, and is so intimately connected with the spirit and manners of the people, that a number of years would be required to feel and study its real effects; and even after the longest preparation, the best description must be but a portrait, devoid of life and of vital expression. A faint sketch alone can be here expected, and the fidelity of the outline must compensate for the want of detail.

The constitution of England is a limited monarchy, counterpoised by two senates, one of hereditary peers, the other of representatives, who are, or ought to be chosen by the people. Such senates were not unknown to the other European nations, and have rather sunk into disuse from their own perversion of their power, than from the despotism of the sovereigns. In France, long before the States General were discontinued, their meetings had been execrated by the people; as instead of defending their privileges, the members only attended to their own private interests, and imposed exorbitant taxes, which were consumed by the greedy courtiers, with very small profit to the royal treasury. Hence, far from incurring any blame, the kings of France acquired great popularity, and were idolized by the nation, for delivering them from the scourge of a venal senate, which only served to increase oppression and expenditure. Many other instances might be adduced to prove, that the very existence of such senates depends upon their forming one body and soul with the nation at large; but it will be sufficient to mention the similar suicide which happened in Denmark, in the last century, when the people, disgusted with the selfish views of the senate, requested the monarch to annihilate it, and assume the entire power: and the absolute form of government has since continued, though modulated by several councils, which have the effect without the form of the senate. The English senates, on the contrary, owe their stability to a general concurrence with the popular voice;

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arifing partly from their form, and partly from a fympathetic and gradual connection which pervades all ranks.

King.

Our lawyers pronounce that the King of England unites in his perfon the dignity of chief magiftrate, with the fanctity of a prieft: and the title of Sacred Majefty, appears to have commenced when he affumed the function of Head of the church. So auguft is his perfon, that even to mention or intend his death, is a capital offence, when in all other cafes the deed alone is punifhable. Fortefcue, in his old emphatic language, has defcribed the office of the King of England to be "to fight the battles of his people, and to judge them with moft righteous judgment." At his coronation he folemnly fwears to govern his people according to parlimentary ftatutes, and the law of the country; to maintain the proteftant religion; and to preferve the legal rights and privileges of the bifhops, clergy, and church [1].

The royal prerogatives have never been ftrictly defined; and, perhaps it is preferable in a government, which afpires not to ideal perfection, but to practical benefit, that they fhould be capable of great energy and extent; as, in cafes of emergency, even republics have been forced to entruft abfolute power to a dictator. The acknowledged prerogatives are chiefly to declare war and to make peace, a power upon which the whole of public profperity may be faid to depend; to form alliances and treaties; to grant commiffion for levying men and arms, and even for preffing mariners; for the power of impreffing into the land fervice, was abandoned in the reign of William and Mary; yet in cafes of great peril, there can be little doubt but the king, in concurrence with parliament, might order every man to affume weapons of war. To the king alfo belong all magazines, ammunition, caftles, forts, ports, havens, and fhips of war: he has alfo the fpecial management of the coinage, and determines the alloy, weight, and value [2]. The prerogative alfo extends to the affembling, adjournment, prorogation, and diffolution of parliament; and to its removal to any place. The royal affent is neceffary to impart validity to an act of parliament, though it has never become neceffary to withhold it, fince the ma-

[1] Chamberl 52. Delolme, 90.

[2] Chamberl. 48, &c. Blackftone, B. I. c. iii. &c.

nagement of the ſenate has become the profeſſed office of the miniſter. The king may not only increaſe the Houſe of Peers, but that of Commons, by empowering any town to ſend burgeſſes to parliament; yet the latter prerogative appears to have become obſolete, for in the reign of Charles II. the interference of the legiſlature was eſteemed neceſſary to enable the city of Durham to ſend repreſentatives. The ſovereign alſo enjoys the nomination of all officers on ſea or land; of all magiſtrates, counſellors, and officers of ſtate; of all biſhops, and other great eccleſiaſtical dignitaries; and is not only the fountain of honour but of juſtice, as he may pardon any offence, or mitigate the penalty. As Head of the church he may call a national or provincial ſynod, and with its conſent enact canons, either relating to faith or practice. The other prerogatives are more minute, and more adapted to juriſprudential enumeration. The more important exceptions are, that he cannot enact new laws, or impoſe new taxes, without the conſent of both houſes of parliament. GOVERNMENT.

The parliament, or national council, claims the next conſideration. Originally both the nobles and the commons met in one houſe; and as the greateſt national events depend, not on deſign, but on chance, or, more properly, the will of heaven, it is not impoſſible that the mere inconvenience of not finding halls large enough for our then ambulatory parliaments, might have occaſioned the diviſion into two houſes, unknown in any other country, and which in fact may be regarded as the ſole foundation of Engliſh liberty. The houſe of peers may be ſaid to have exiſted from the earlieſt period of our hiſtory. Concerning the commons, authors are diſſentient, the Whigs aſſerting that they formed a part of the *Wettena-Ge-Mot*, or the aſſembly of ſages, and it is not improbable that commoners of diſtinguiſhed ability, particularly in the laws, were admitted to that great council, which chiefly conſiſted of the military chiefs. On the other hand it ſeems improbable that delegates from towns ſhould have been then known, as the idea ſeems too abſtract and complex for a rude people. The Tory writers aſſert that there is no appearance of the commons, nor any authority for their parliamentary exiſtence, prior to the 49th of Henry III, when the firſt records concerning them ariſe. However this be, the preſent conſtitution of the parliament Parliament.

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parliament of England, may certainly be traced to near the middle of the thirteenth century; but it remains unknown at what precise time happened the important separation of the commons from the peers.

Peers.

The peers of England only require the full age of twenty-one years, to become hereditary senators in their several degrees of duke, marquis, earl, viscount, and baron, formerly created by investiture, or symbolic forms, but latterly by patent[3]. The Duke is so styled from the Latin *dux*, a leader or general; the title of Marquis springs from the Gothic language, and implies the commander of a march or frontier: the Earl and Baron are also from the Gothic, and merely imply eminent men; the Viscount is Latin, and signifies the lieutenant of the count or earl. The various orders of nobility have been preserved more pure in England than in any other country; owing partly to the laws of primogeniture, partly to their senatorial office, partly to the institution of the college of heralds. In Germany, and some other countries, the nobility has fallen into comparative degradation, from the extension of the title to all the sons, and from the presumption of adventurers. The peers are privileged from personal arrest, except for treason, felony, and a few other high offences. They are not only exempt from serving in juries, but must be tried by a jury of peers, who return their verdict, not upon oath, but upon their honour. They are addressed by the ceremonial form of *My Lord*, corresponding with the French *Mon Seigneur*; and the law is so watchful of their reputation, that the statute of *scandalum magnatum* was enacted, to prevent any scandal against them, or discord between them and the people. Every peer may appoint a proxy to vote for him in the senate, a privilege unknown to the commons.

In the house of peers is placed the royal throne; but the monarch rarely appears, except at the meeting or prorogation of parliament, when he proceeds to the house in great state; the attendance of the commons is commanded, who stand below the bar, and the king pronounces his speech, generally the composition of the minister. The arrangement of the house of peers is well conceived, and produces a

[3] Chamberl. 168. Blackstone, B. I. c. ii.

grand

grand effect. The wool-ſacks upon which the chancellor, and the judges when called for their advice, are ſeated, conſtitute a remarkable feature, eſteemed ſymbolic of the ſtaple commodity of the country. The appearance is yet more magnificent, when the peers ſit as judges in Weſtminſter-hall; the greatneſs of the perſons, and the ſolemnity of the occaſions, exciting impreſſions of ſingular ſublimity. GOVERNMENT.

The houſe of commons conſiſts of knights, citizens, and burgeſſes, choſen by counties, cities and boroughs, in conſequence of royal writs directed to the ſheriff. To reſtrict the tumult of popular election, it was enacted by Henry VI, that none ſhould vote for a knight of the ſhire, except freeholders worth forty ſhillings a-year, which at the preſent value of money, may be computed at twenty or thirty pounds. It is ſingular that copyholders were excluded. The elections for the cities and boroughs, are regulated by their charters and cuſtoms; ſometimes only a few citizens have a right to poll, ſometimes all the inhabitants. The members, and their menial ſervants, are exempted from arreſt in civil cauſes, on their journey to parliament, during their attendance, and on their return; nor can they be queſtioned out of the houſe for any ſentiment there uttered. It has been diſputed whether members be not rather to be regarded as repreſenting the people at large, than as intereſted in particular diſtricts, and obliged to liſten to the voice of their conſtituents, whoſe private intereſt might, perhaps, interfere with the general benefit. The commons form the grand inqueſt of the realm, and may impeach or accuſe the greateſt peers; but their chief privilege, and upon which their whole power entirely depends, is the levying of money, in which they are deſervedly ſo jealous that they will not permit the ſmalleſt alteration in a money-bill. This amounts to an almoſt abſolute *veto* on any public meaſure, and eſpecially on war. The houſe of commons conſiſts of 558 members *; but by ſickneſs, important offices, and indiſpenſable avocations, the houſe rarely preſents above two thirds of the number. A ſpeaker, or preſident, is choſen at the meeting of every new parliament; but is uſually continued from one to another, as the office requires a complete and ready knowledge of the forms, and conſiderable abilities. COMMONS.

* Since the union with Ireland 658.

Acts

GOVERNMENT.

Acts of parliament, which conſtitute the ſtatute law of the kingdom, may originate in either houſe, though they commonly make their firſt appearance in the houſe of commons. The procedure is in the following form. Any member may move for a *bill*, (the term *act* is not applied till all the ſtages be complete,) which being ſeconded, the mover, and others who ſupport him, are ordered to prepare it. When preſented, and leave given to bring it to the table, it is read by the clerk, the clauſes are debated, and a day appointed for a ſecond reading. After it is again read and debated, it is *committed;* that is, if important it is referred to a committee of the whole houſe, during which the ſpeaker leaves the chair, and another member ſits at the clerk's table as chairman: or, if little momentous, to a private committee, which meets in a ſeparate chamber. When every paragraph has been carefully examined, every clauſe put to the queſtion, and the blanks and amendments completed, the chairman makes his report. The amendments and added clauſes are then read, and the ſpeaker puts the queſtion, whether they ſhall be read a ſecond time; and being read and debated, the bill is ordered to be ingroſſed, that is, fairly written on parchment. After the third reading, the ſpeaker, holding the bill in his hand, enquires if it ſhall paſs the houſe; if agreed to, the clerk writes on the bill *Soit baillé aux ſeigneurs*, or if in the houſe of lords, there is written, *Soit baillé aux communes*. If the bill be rejected, it cannot be again moved during that ſeſſion; and it is an uſual mode to move that the bill be read in three months, when by exceeding the limits of the ſeſſion, it amounts to a leſs invidious rejection. An advantage of the committee of the whole houſe is, that the members may anſwer and reply; whereas in the conſtituted ſenate no member can ſpeak twice, except in explanation. A ſilent vote in the houſe of commons, is given by *aye* and *no;* in the houſe of lords by *content* and *not content*.

The proceedings in the houſe of lords are nearly ſimilar; and if a difficulty ariſe, a conference is demanded, in an appropriated chamber, where it is debated; and either compromiſed, or the bill abandoned. When a bill has paſſed both houſes, the king, either in perſon or by commiſſion, imparts his conſent, the clerk repeating to public bills,

Le

Le Roy le veut; if private, *ſoit fait comme il eſt deſiré.* The denial of the royal concurrence uſed to be *Le Roy s' aviſera.* GOVERNMENT.

The attention of the nation is chiefly bent upon the parliament, when grand political queſtions ariſe concerning war and peace, or affecting the conſtitutional liberties of the land. On ſuch occaſions the utmoſt powers of eloquence are exerted; and ſpecimens produced worthy of Greece or Rome. Such trials of elocution may either ariſe in the ſtages of a bill as before deſcribed; or by the ſpecial motion of a member for ſome particular object, or addreſs to the throne.

Adjournments may frequently happen in one ſeſſion, and the buſineſs is continued and reſumed; but a prorogation terminates the ſeſſion, and the bills not then paſſed muſt recommence their whole progreſs. By a modern ſtatute, the death of the king does not, as formerly, terminate the parliament; which, on the contrary, had it been previouſly diſſolved, may, on that event, reſume its functions.

The forms of the houſe of commons are obſerved with great punctuality, and it is the ſpecial duty of the ſpeaker to ſuperintend their enforcement; a precaution indiſpenſible in a popular aſſembly, as we may judge by having ſeen the ſenate of a neighbouring nation occaſionally degenerate into a bear-garden. The houſe of commons is deſervedly eſteemed the very palladium of Engliſh liberty: they hold what is called the omnipotence of parliament, and if that power were not guided by principle, the ruin would be univerſal. Not the general execration of the human race, not the infamy eternized by the hiſtoric page, could ever avenge the injury done to their country; if inſtead of protecting the lives, properties, and liberties of the nation, by whom they are choſen for that ſole purpoſe, they ſhould, for the ſake of periſhable wealth or honours, become the betrayers of their brethren, and the ſycophants of deſpotiſm, of whatever kind or deſcription.

Such are the three grand component parts of the Engliſh conſtitution; but, perhaps, its moſt beneficial and popular effects, ariſe from the mode of adminiſtering juſtice, and other ramifications. For the ſake of connection, however, it is proper firſt to conſider the Privy Council, and the other diviſions of the government.

GOVERNMENT. Privy Council.

Under whatever form of monarchy, Privy Councils are found to be coeval with the ſtate. It is impoſſible for one man, however tranſcendent his abilities, to manage the various buſineſs of the government. In the moſt barbarous periods, a few men of eminent birth or wiſdom have been ſelected by the ſovereign for his aſſiſtants. While the national aſſembly only met on ſolemn occaſions, the advice of the privy council was ready on every emergency, and it hence became the chief engine of regular and continual authority. In England the powers of the privy council continue to be very extenſive, even in modern times. At more ancient periods it acted in a high juridical capacity, was wont to be conſulted, even by the judges, in decrees of great conſequence, and the parliament uſed to tranſmit ſeveral important topics to its ſole conſideration[t]. At preſent it is chiefly employed in deliberations on affairs of ſudden emergence; on peace and war; and ſpecial provinces of the royal prerogative. The members are choſen by the king; and on changes of adminiſtration are ſeldom eraſed, though the members in oppoſition never attend. They are ſtyled Right Honourable, and are ſworn to obſerve ſecrecy: the loweſt at the board pronounces his opinion firſt, and the king, if preſent, concludes with declaring his judgment. A privy council is ſeldom or never held, without the preſence of at leaſt one of the ſecretaries of ſtate; who, till the reign of Elizabeth, uſed to ſtand by the royal chair, but have ſince ſitten at the board as privy counſellors. Their office is of the higheſt truſt and importance, and is at preſent divided into three departments. Dependent on the ſecretaries of ſtate is the ſtate-paper office at Whitehall, which has in charge the writings of ſtate and council, diſpatches, negociations, and the like, from ancient times, thus preſenting moſt important documents of hiſtory.

Miniſtry.

Even at an early period, when the monarch maintained in his own hands a great ſhare of the adminiſtration of juſtice, and of the actual exerciſe of authority, there were intervals of abſence or recreation, in which he delegated the chief management of buſineſs to ſome ſelect perſon, uſually an eccleſiaſtic, whoſe cultivated talents qualified him for ſuch an important truſt. To lend more weight to this ſubſtitute, he was com-

[t] Chamberl. 83, and Blackſtone, b. i. c. v.

monly

monly appointed chancellor, or chief adminiſtrator of civil juſtice, was preſident of the houſe of peers, and ſupported the royal influence in that great aſſembly. But in later times, when the management of the houſe of commons became the chief object of the crown, the chancellor of the court of exchequer, as ſuperintendant of the public revenue, is the officer generally conſidered as prime miniſter. The diſtribution of fifty millions a-year, joined with the royal ſupport, has recently carried his power to the higheſt elevation. Next to him in authority are the ſecretaries of ſtate, who are followed by the chancellor, the treaſurer of the navy, the preſident of the council, the paymaſter of the forces, the commiſſioners of the treaſury, and other perſons of high truſt. GOVERNMENT.

The judicature of England is worthy of the higheſt applauſe, with regard to preciſion and purity. It is, indeed, to be regretted that the vaſt number and confuſion of the ſtatutes, render the ſtudy of the laws peculiarly difficult, and that the number of officers and retainers on the courts of juſtice, ſwells the expences of a ſuit to an enormous ſum. But hardly can a country be named on the face of the globe, in which juſtice, civil or criminal, is adminiſtered with more integrity: bribes, ſo frequent in other countries, are totally unknown; and the ſaving of this expence muſt be candidly poiſed againſt other legal diſburſements. Judicature.

The trial by jury is another glorious feature of Engliſh juriſprudence, handed down from the Saxon times, and is juſtly regarded as the very ſafeguard of the lives, liberties, and properties of the nation. Its excellence has been reſpected by the Daniſh and Norman conquerors; and, it is hoped, will be venerated by the lateſt poſterity.

The laws of England in general, form a noble code of juſtice and equity, the precious legacy of remote anceſtors. The ſtream iſſued pure and ſalutary from the Saxon rock; and neither foreign ſources, nor ravaging floods, have been able to contaminate its beneficial qualities. Engliſh juriſprudence regards the civil code as a relic of deſpotiſm; and rarely liſtens to the papal voice of the canon law. It would be idle and extraneous here to attempt, even a brief ſketch of the laws of England. The moſt ſingular uſages are what was termed *Borough* Laws.

GOVERNMENT.

Engliſh, by which the youngeſt ſon, or in defect of iſſue, the youngeſt brother was to enjoy the heritage; as it was to be preſumed that his elder brethren had learned their father's buſineſs [5]. That of *Gavel-kind* is ſcarcely known, except in Kent, and has three branches; the heirs male ſhare all the land alike; each heir may ſell or alienate at the age of fifteen; and though the father be attainted of treaſon, the inheritance paſſes to the progeny [6]. In no country are wills ſo much venerated by law: that of Mr. Theluſſon furniſhes a recent example.

Jury.

All trials, upon common and ſtatute law, are determined by a jury of twelve, choſen as unobjectionable, from a larger number ſummoned by the ſheriff. They have their ſtation in the court, near the judges; and when the examination of the witneſſes, and the pleadings are ended, a judge recapitulates the whole evidence and arguments, and ſtates the law: after which the jury retire, for a ſhorter or longer ſpace, as doubts may ariſe. Upon their return, their foreman declares the verdict, which muſt be unanimous. The neceſſity of unanimity, has occaſioned many difficulties; and it ſeems preferable to decide by a certain majority, as is done in Scotland in criminal caſes. The foreſt and by-laws may here be omitted; but a more vigorous branch of Engliſh judicature muſt not be forgotten. Martial law, or the *Lex Caſtrenſis Anglicana*, may be clearly traced to the reign of Henry V, who iſſued a code of military ſtatutes, publiſhed by Upton and Groſe. The ſtatutes chiefly relate to ſacrilege, priſoners, robbery of merchants, &c. &c. and refer ſolely to the actual exerciſe of war: the pain of death rarely occurs, except in the caſe of any perſon who cries *havoc*, an expreſſion ſeemingly equivalent to "no quarter." Martial law may be proclaimed by the king, regent, or lieutenant general of the kingdom; and even in time of peace, though the prerogative be rarely employed, except during war. It is in fact a dictatorial power, never exerted except on great emergencies. The trials are ſummary and ſevere, as the neceſſity of the caſe authoriſes.

Martial Law.

Courts of Juſtice.

In a ſhort view of our courts of law, the next in dignity to the houſe of lords is the court of king's bench, ſo called becauſe the ſovereign was underſtood to judge in perſon, and its juriſdiction of courſe

[5] Chamberl. v. i. 188. [6] Ibid. 17.

extends

extends to the whole kingdom. The prefiding judge is denominated Lord Chief Juftice of England. Here are chiefly determined what are called pleas of the crown; and appeals lie from feveral other courts. The court of chancery judges caufes in equity, to moderate the rigour of the law, and defend the helplefs from oppreffion, and efpecially to extend relief in three cafes, fraud, accident, and breach of truft. The chancellor himfelf is the fupreme judge. The mafter of the rolls, or keeper of the important papers enrolled in chancery, is an officer of great dignity, and confiderable patronage. The office of the rolls contains the charters, &c. granted by Richard III, and his fucceffors; thofe of more remote antiquity being lodged in the Tower. The court of common pleas judges, as the name imports, of the common fuits between fubject and fubject; and tries all civil caufes, real, perfonal, or mingled, according to the precife precepts of the law. The court of exchequer, fo termed from the ancient mode of accounting upon a chequered board, decides all caufes relating to the royal treafury or revenue. The lord treafurer, and the chancellor of the exchequer, may be regarded as honorary prefidents, while the firft actual judge is the lord chief baron. Three other judges, and many officers, belong to this high court. There is alfo a court for the duchy of Lancafter, having recognizance of the revenues of that duchy, annexed to the crown by Henry IV[1]. GOVERNMENT.

For the more commodious and general diftribution of juftice, the kingdom is divided into fix circuits, which are vifited by the judges in the fpring and autumn, when they fit and determine all caufes of importance, civil and criminal; a method much to be preferred to the fedentary parliaments of France, in which the judges were biaffed by local attachments. In the meanwhile more minute cafes are determined by the juftices of the peace, who may be traced to the fourth year of Edward III. Their office is chiefly to commit criminals to prifon, and to infpect the execution of fome particular laws relating to the poor, high-ways, and the like. They have a commiffion under the great feal, and the moft refpectable are ftyled juftices of the quorum, from the words in the commiffion, *Quorum* A. B. *unum effe volumus*. The *cuftos* Circuits. Juftices of Peace.

[1] Blackftone, b. iii. c. 4.

rotulorum,

GOVERNMENT.

rotulorum, or keeper of the rolls, produces them at the quarter ſeſſions, where the juſtices meet once in three months: the grand inqueſt, or jury of the county, is here ſummoned, which enquires concerning crimes, and orders the guilty to jail till the next circuit or aſſizes.

Sheriffs.

The office of ſheriff, or præfect of the county, is to execute the royal mandates, to impannel juries, to bring perſons to trial, and to ſee the ſentences executed, to collect fines, and remit them to the exchequer, and to preſerve the tranquillity of the ſhire. On the circuits he meets and attends the judges, with a gallant train of officers and ſervants. The ſheriffs are annually pricked with a golden needle, by the king out of a liſt of ſix gentlemen of the county, drawn up by the itinerant judges.

Anciently there was a bailiff in every hundred, but the office is now rare, or fallen into diſuſe. The conſtables perſonally aſſiſt in the preſervation of the peace, and execute the warrants of the juſtices. The coroner was originally a man of high rank, who ſhared the power of the ſheriffs, particularly in what regarded the pleas of the crown; at preſent his duty is to enquire, by a jury of neighbours, into caſes of violent death. The clerk of the market ſuperintends the weights and meaſures, and it were to be wiſhed, for the benefit of the poor, that the office were multiplied, and ſtrictly enforced.

Such are the chief magiſtrates in the country. Cities and towns are generally ruled by a mayor and aldermen, or by ſimilar officers, under different appellations, whoſe juridical power little exceeds that of the juſtices of peace. If a town ſend members to parliament, it is denominated a borough. The villages are chiefly under the authority of the lord of the manor, who holds courts, and retains many relics of feudal juriſdiction: and, in the words of a well-informed writer, "Every "little village hath almoſt an epitome of monarchical government; of "civil and eccleſiaſtical polity within itſelf; which, if duly retained, "would render us a very happy people[1]."

To enumerate the various puniſhments inflicted by the laws of England, would be an unneceſſary taſk. It has been juſtly obſerved that they are too ſanguinary, and that their frequency diminiſhes the

[1] Chamberl. 129.

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intended purpose of impressing terror. If death were only inflicted in cases of murder, the relaxation would be found beneficial to the community. As man is an animal reared with considerable difficulty, and may generally be rendered useful, it would certainly be preferable to send criminals for life to the new and distant Asiatic settlements, than, by the waste of blood to lessen strength and population. GOVERNMENT.

The population of England has been recently ascertained by order of parliament, and the amount of each parish printed in a large volume. The result is as follows: Population.

	Houses.		Persons			Occupations.			
	Inhabited	By how many Families.	Uninhabited.	Males.	Females.	Persons in Agriculture.	In Trade & Manufactures.	Other Persons.	Total of Persons.
England,	1,467,870	1,778,420	53,965	3,987,935	4,483,490	1,514,227	1,789,531	4,606,530	8,331,434
Wales,	108,053	118,303	3,511	257,178	284,368	189,062	53,822	266,573	541,546
Arm. Navy,				469,188					469,188
Convicts on brd. Hulks.				1,410					1,410
	1,575,923	1,896,723	57,476	4,715,711	4,627,867	1,713,289	1,843,353	4,873,103	9,343,178

The first abstract (printed July 1801) presents the following statement:

Regular forces, fencibles, and militia, on March 10th, 1801,	186,733
Artillery, and engineer forces, - - ditto -	11,618
Seamen, and marines in the Royal Navy, ditto -	106,128
Marines at head-quarters, - - ditto -	20,151
Seamen employed under the Board of Customs, ditto	897
Seamen employed in registered trading vessels, ditto	143,661
	469,188

Sufficient materials do not yet arise for exact enumeration of the various classes of inhabitants, a most important barometer of the political state *.

To

* Towards the beginning of the last century, Gregory King, an able political calculator, drew up the following table of the ranks of persons in England. It must be premised, that he has followed an exceptionable mode, in including the domestics in the families of each rank, whereas male and female servants ought to have formed a class apart.

POPULATION. Colonies.

To the enumeration of the inhabitants of England, may be added many exterior colonies and settlements, the most important of which are now in Asia; but as the climate of Hindostan is rather adverse to European constitutions, it may be doubted whether our settlements there, though containing a considerable population, can be considered

Ranks.	Number of Families.	Heads in each.	Number of Persons.
Spiritual Lords	26	20	520
Temporal Lords	160	40	6,400
Knights	600	13	7,800
Baronets	800	16	12,800
Eminent clergymen	2,000	6	12,000
Eminent merchants	2,000	8	16,000
Esquires	3,000	10	30,000
Gentlemen	12,000	8	96,000
Military officers	4,000	4	16,000
Naval officers	5,000	4	20,000
Persons in lesser offices	5,000	6	30,000
Persons in higher offices	5,000	8	40,000
Lesser clergymen	8,000	5	40,000
Lesser merchants	8,000	6	48,000
Persons in the law	10,000	7	70,000
Persons of the liberal arts	15,000	5	75,000
Freeholders of the better sort	40,000	7	280,000
Shopkeepers and tradesmen	50,000	4½	225,000
Artizans	60,000	4	240,000
Freeholders of the lesser sort	120,000	5½	660,000
Farmers	150,000	5	750,000
Gipsies, thieves, beggars, &c.	—	—	30,000
Common soldiers	35,000	2	70,000
Common sailors	50,000	3½	150,000
Labourers and out-servants	564,000	3	1,274,000
Cottagers and paupers	400,000	3	1,300,000
			5,499,520

It is now supposed that near 1,600,000 persons are employed in manufactures, and Mr. Young (Northern Tour, vol. iv. p. 364.) computes that 2,800,000 are occupied in farming. The number of domestics allowed by King, might be in part computed, by reducing the superior families to four. The number of paupers and beggars, who, in fact, detract from the national strength, can now scarcely be supposed less than a million. The sailors and soldiers amount to about 400,000. The shopkeepers are perhaps triple. With these additions, &c. it would be easy to swell the list to our present supposed population of eight millions. The reader may also consult Mr. Grellier's table of the productive and unproductive classes, in the Monthly Magazine, vol. x. p. 27; but as he estimates the population of England at only five millions and a half, his assumptions cannot be entirely credited, while some late writers, on the contrary, increase the population of England alone to eleven millions!

as

as permanent colonies. The natives subject to Great Britain cannot be now calculated at less than twenty millions, in itself an empire. The acquisition of the Dutch settlements, the colony of New Holland, and more minute stations must also be taken into the account. In America, and what is called the West Indies; Canada, Nova Scotia, Newfoundland, and the more northern settlements, with Jamaica, and the other islands, may perhaps contain a million. In Africa, the Settlements, at the Cape of Good Hope, the Island of St. Helena, and at Sierra Leone, present an insignificant number, and Gibraltar is rather to be regarded as a military station. If we compute the North American States, detached from the mother country, at a population of five millions, England at nine, Scotland at two, Ireland three, and our colonies and settlements at two millions, we shall find in the various regions of the globe an increasing population of twenty-one or twenty-two millions, diffusing the English language and manners to a vast extent. Population. Colonies.

The army of England has latterly engrossed a considerable share of the population. It is estimated in regulars at 41 regiments of cavalry, and 144 of infantry, while the fencibles form 45 regiments, and the militia 86, exclusive of artillery and engineers [1]. The *effective* rank and file, including invalids, militia, and foreign corps, as well as the regular and fencible troops, was returned to the secretary of war, in December, 1800, as amounting to 168,082. The volunteer corps in Great Britain and Ireland, may probably amount to 60,000 effective men [2]. Army.

But the great rampart, and supreme glory of Great Britain, consist in her navy; in size, strength, and number of ships, far exceeding any examples on record. If abundance of documents did not exist, the following genuine list would scarcely be credited by posterity. Navy.

[1] Army List, Jan. 1801.

[2] So the daily papers, yet by the same authority, the secretary of war, on the 16th Feb. 1801, computed the regulars at 193,187; militia, 78,040; fencibles, 31,415; in all, 302,642. The expence near thirteen millions! This computation, though including Ireland, seems exaggerated.

POPULATION, &c. Navy List, Jan 1801.

Statement of the Distribution of the British Naval Force, exclusive of the hired armed Vessels, which are chiefly employed in protecting the Coasting Trade of Great Britain.

	Line.	Fifties.	Frigates.	Ships, &c.	Total.
In Port and fitting - - -	27	7	46	98	178
Guard ships - - - -	4	0	1	0	5
In the English and Irish Channels - -	33	1	26	45	105
In the Downs and North Seas - -	9	1	17	36	63
At the West India Islands, and on the passage -	1	0	21	24	46
At Jamaica - - - -	5	1	22	12	40
In America, and at Newfoundland - -	2	0	4	5	11
Cape of Good Hope, East Indies, and on the passage	10	8	20	19	57
Coast of Africa - - - -	0	0	1	3	4
Coast of Portugal, Gibraltar, and Mediterranean -	16	2	53	28	99
Hospital and Prison ships - - -	16	1	1	0	18
Total in Commission -	123	21	212	270	626
Receiving Ships - - -	9	1	7	0	17
Serviceable, and repairing for service - -	2	0	1	0	3
In ordinary - - - -	44	3	23	44	114
Building - - - - -	17	2	8	0	27
Total -	195	27	251	314	787

To this may be subjoined the list of captures from the several hostile powers, from the commencement of the war, to January, 1801, after premising that many of them were already included in the above state of the navy:

	Line.	Fifties.	Frigates.	Ships, &c.	Total.
French -	54	2	137	145	338
Spanish -	8	0	14	31	53
Dutch -	17	8	32	32	89
	79	10	183	208	480
Privateers of all nations		-	-	-	832
			Grand total -		1312

For this immense fleet, the number of seamen annually voted, amounts from a hundred to a hundred and twenty thousand; a number almost incredible, and which no other country, ancient or modern, could have supplied. In China, indeed, half of the inhabitants may be said to live on the water, but in skill, spirit, and enterprize, are far inferior to British seamen *. The

* In November, 1801, the minister adduced to the house of commons the following comparative statement:

NAVY OF GREAT BRITAIN.

In 1793,	Ships of the line -	135	In 1801,	202
	Frigates and smaller vessels	133	-	227
		268		429

NAVY

The naval power of Great Britain, conſtitutes ſo ſtriking and important a feature in the national portrait, that it merits particular illuſtration. Even in the Saxon times we find conſiderable fleets mentioned of the ſmall veſſels then in uſe. One of the Northumbrian monarchs aſſembled a numerous fleet near Jarro, the monaſtery of Beda, in an extenſive haven of the time, now become a ſalt marſh. About the year 882, we find that Alfred directed a powerful fleet againſt the Daniſh invaders[1]; but it is to be regretted that the early writers have not been more particular with regard to the number and form of the veſſels. The fleet of Edgar is alſo celebrated; but the author of the Saxon Chronicle aſſures us, that the armament of Ethelred II, in the year 1009, exceeded any which England had ever before beheld; and as William of Malmeſbury computes that of Edgar at four hundred veſſels, this may probably have amounted to five hundred of the ſmall ſhips then known. But the devaſtations of the Danes and Normans occaſioned ſuch a decline in the naval power of England, that Richard I. was obliged to have recourſe to foreign veſſels for his cruſade. In the reign of John we, for the firſt time, find commemorated a ſignal victory of the Engliſh and Flemings, over the French fleet of Philip Auguſtus, which was computed at ſeventeen hundred ſhips, or rather boats[2]. The Engliſh monarch John, inſolent in proſperity, mean in adverſity, in the pride of his triumph, was the firſt who ordered the SALUTE to be paid by foreign veſſels to the national flag. The fleet of England thenceforth continued to be always reſpectable, and generally victorious. In the reign of Edward III, it had acquired ſuch pre-eminence, that in his gold coin, the firſt ſtruck in England, he ap- NAVAL POWER.

NAVY OF FRANCE.

In 1793,	Ships of the line	80	In 1801,	39
	Frigates - -	64	-	35
		144		74

The number of ſhips of the line in actual ſervice is ſuppoſed never to have exceeded one hundred and twenty.

[1] See Aſſer. Vita Alf. St. Croix, Hiſt. de la puiſance navale de l'Angleterre, Paris 1786, 2 vols. 8vo.

[2] Near Dam, in Flanders, A. D. 1213. Damme, now inland, a league N. E. of Bruges, was formerly a maritime town, and the ſea waſhed its walls. Guicc. Deſcript. Belg.

NAVAL POWER.

pears in a ſhip, the ſymbol of commerce and maritime power; but the preponderance of the Engliſh armaments, over thoſe of France, only became permanent and deciſive, a little more than a century ago, after the battle of La Hogue. Spain had yielded the conteſt ſince the deſtruction of her great armada; and Holland had been greatly reduced in the naval conflicts under Charles II, ſo that no other rival remained, and Great Britain maintains a fixed ſuperiority over the ocean. In the mechaniſm of ſhips, the French builders certainly excel; but, in the ſoul of ſhips, ſpirited, alert, and ſkilful ſeamen, no country can pretend to vie with Great Britain. The progreſs in number of veſſels has been more rapid in this reign, than at any former period, as may appear from the comparative ſtatement in the note, which includes every military veſſel, from the firſt rate to the frigate [1].

The ſpecial ſuperintendance of the navy, is committed to the board of admiralty, compoſed of admirals of known ſkill, and of peers, whoſe impartiality generally regards merit alone in this important ſervice. The recent conduct of maritime war, has been crowned with diſtinguiſhed ſucceſs; and whilſt the admirals muſt be allowed to rival any names in naval hiſtory, ancient or modern, the fame of Nelſon has been conſecrated by his glorious death.

Before the revolution, the impreſſing of men was legal, even for the land ſervice; and in more early times, many forms of requiſition were uſual, workmen were impreſſed to build royal caſtles, artiſts for their decoration, and even ſinging boys for the chapel. Amidſt a wide diffuſion of liberty, and that individual ſecurity which is the moſt home-felt bleſſing of our conſtitution, it has been found impoſſible to abandon the impreſſing of ſeamen. The army naturally ſupports itſelf, for war, by producing a ſtagnation of manufactures, raiſes a ſupply of ſoldiers;

[1]

Under James II.	- -	173
William III.	- -	273
Anne -	- -	284
George I, in 1721	- -	206
George II, in 1734	- -	208
1746	- -	276
1755	- -	241
George III, 1762	- -	343
1801	- -	787

but

but the ſeamen muſt be trained and inured to their peculiar element and profeſſion; and the ſervice being abſolutely indiſpenſable, it becomes a meaſure of political neceſſity to enforce it, if not offered voluntarily. This unavoidable additional hardſhip upon a claſs of men, ſubject to ſo many toils and deprivations, is deeply to be regretted; and every endeavour ſhould in juſtice be exerted, to render their ſituation as comfortable as poſſible, and to impart to them a ſhare of the national opulence, which their vigour ſo zealouſly protects. NAVAL POWER.

In ancient times, the royal revenue chiefly aroſe from the domains or lands appropriated to the crown; from amerciaments civil and criminal, which paſſed to the fiſc, or treaſury; and from cuſtoms on goods imported and exported. As in war each ſoldier was obliged to maintain himſelf for a certain time, the expenditure was not much increaſed. Upon extraordinary emergencies, it appears that a contribution was raiſed by the conſent of the national council. In later periods, ſubſidies were granted to the amount of a fifteenth, or a tenth, on the landed income, and a proportionable rate on moveable goods. As ſociety advanced, taxes began to be impoſed on the materials themſelves; and from a ſmall plant an enormous tree has ariſen, with a labyrinth of roots, which, in the opinion of ſome politicians, undermine the iſland, while others believe that they only produce a more firm conſolidation. Revenue.

The exciſe forms one of the moſt productive branches of the revenue, amounting to between ſeven and eight millions. Next ſtand the cuſtoms, which produce about half that ſum. The ſtamps and incidental taxes, as they are termed, ariſe to near three millions. The land tax has been recently rendered perpetual, and ſold to the proprietors of eſtates, and other individuals, a meaſure which has had a favourable effect in raiſing the price of ſtocks. But inſtead of the land tax, now appear thoſe on ſugar, tobacco, and malt, amounting to 2,750,000*l.*; other ſupplies ariſe from the Eaſt India Company, lotteries, &c. In addition to all theſe, the income tax is ſuppoſed to yield 7,500,000*l.*, and if rendered perpetual, might ſwell the permanent revenue to 25 or 26,000,000*l.* But, in the year 1799, it was ſuppoſed that the additional

Revenues.

tional ſums raiſed by loans, &c. ſwelled the national expenditure to near 60,000,000*l.* ſterling *.

Of the permanent taxes, the greater part is employed in diſcharging the intereſt of the national debt, which, after the American war, amounted to more than 239,000,000*l.* while the intereſt exceeded 9,000,000*l* †. At preſent the national debt is about 480,000,000*l.* and the intereſt about 19,000,000*l.* To alleviate this growing burthen, a ſinking fund was inſtituted in 1786, by which between 20 and 30,000,000*l.* may be conſidered as already redeemed.

The national debt began in the reign of William, and grew into what have been called the funds, or ſtocks, only ſynonymous terms for the public debt ‡.

The taxes have not only increaſed the expence of every article of life, but have of courſe ſo enormouſly ſwelled the diſburſements of war, that perhaps in a ſhort time it may become too dear a game, even for princes. During peace the national expences are greatly reduced. The civil liſt, from which are defrayed the ſalaries of officers of ſtate, judges, ambaſſadors, &c. together with the expences of the royal family, amounts to about 1,000,000*l.* annually.

Political Importance, and Relations.

With ſuch a prodigious command of national treaſure, the political importance and relations of Great Britain, may be ſaid to be diffuſed over the world, for wherever money influences man, there may her power be perceived. The union of Scotland with England, delivered the latter country from the perpetual check, exerciſed by politicians, ancient and modern, that of exciting an enemy from behind, and thereby dividing the power of an antagoniſt. That with Ireland, if preſerved by wiſe and lenient meaſures, muſt alſo impart additional energy. The moſt important political conſiderations, are thoſe be-

* For 1801, the miniſter computed it at 42,268,000*l.*; but the real amount was not capable of being foreſeen.

† In 1790, the national debt was 247,981,927*l.*; the intereſt and charges of management, 9,469,117*l.*

‡ See Mortimer on the ſtocks, where the reader will find a curious account of ſtock-jobbing, or buying againſt time, a ſpecies of gambling. In public loans, [illegible] 2, the engager commonly gains 10 per cent. while the laws againſt uſury are only put in force in private tranſactions. Hence new loans are greedily filled.

tween

tween Great Britain and France. It ſeems hardly reconcileable to humanity, or to any idea of divine benevolence, to ſtyle any country the natural enemy of another: but human affairs, alas, are ſeldom conducted with pure benevolence and humanity, and cannot poſſibly be, till all nations become benevolent and humane. If France muſt not be ſtyled the natural enemy of Great Britain, ſhe has, for many centuries, been a conſtant and jealous rival; eagerly embracing every opportunity to leſſen Britiſh proſperity and power; an impulſe which will probably continue till all men ſhall become philoſophers; or, in other words, ſhall be ruled by the maxims of univerſal reaſon; a perfection too viſionary to be expected, as man, in all ages and climates, and under whatever forms of government, has ever been found to be chiefly influenced by his habits and paſſions. Such being the caſe, it has ever been regarded as the political intereſt of England, to balance and divide the enmity of France, by a ſtrict alliance with ſome limitaneous ſtate. In this point of view even Savoy has been found uſeful, though its power be only adequate to a ſlight diverſion. Nor are the German ſtates bordering on France, Swabia, and the two Circles of the Rhine, nor even Switzerland itſelf, capable of much exertion. Hence it might ſeem that ſound policy would dictate as complete a conſolidation of German power, as could be effected, in order to give a decided and vigorous check to that of France from behind. The poſſeſſion of the Netherlands by the powerful Houſe of Auſtra, was certainly of great moment to the ſafety of Great Britain, eſpecially ſince Spain and Holland have fallen into decline. The latter country preſents, however, a connection of ſuperlative importance to England, being her grand mart of trade with the Continent. Ruſſia, a moſt powerful monarchy, though once drawn into the vortex of the preſent grand commotion, is too remote to afford laſting aſſiſtance; but her amity is valuable in a commercial view, and as ſhe might, by no great ſtretch of oriental power, detach an army into Hindoſtan, and overturn our opulent poſſeſſions. An alliance with Pruſſia has ever been regarded as deſirable, though not of ſuch conſequence againſt France as that with Auſtria. The connection with Portugal has been enforced by mutual advantages

Political Importance and Relations.

POLITICAL IMPORTANCE AND RELATIONS.

advantages of commercial intercourſe*; and by the family compact between France and Spain. As to Denmark and Sweden, their friendſhip or enmity is little momentous; but as Sweden has long maintained a ſtrict connection with France, it is moſt natural that Britain ſhould balance it, by cultivating that of Denmark.

Such ſeem to have been the leading ideas of political writers, concerning the chief relations to be maintained by the Britiſh empire.

* Firmly eſtabliſhed by the Methven treaty, 1703. Theſe conſiderations were written before the late connections of Ruſſia, Sweden, Denmark, and Pruſſia, with France.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Cuſtoms.—Language.—Literature.—The Arts.—Education.—Univerſities.—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE ſingularity of manners in England, has often excited the ſurpriſe of foreigners, and the attention of our own ethic writers, who have attempted to deduce the ſources from moral and phyſical cauſes; eſtimating as the firſt, the freedom diffuſed over the country, which permits the indulgence of individual inclination; and recurring for the latter, to the perpetual variations of the climate, producing effects of electric ſympathy on the animal ſpirits.

The conſideration of national manners may be conveniently referred to four diviſions: 1. Birth, marriage, death; 2. diet; 3. houſes and dreſs; 4. amuſements.

The ceremonies of baptiſm, marriage, and burial, admitting of few variations in moſt Chriſtian countries, it becomes unneceſſary to conſider that diviſion. The Engliſh are generally eſteemed to exceed in the uſe of animal food; but, after the recent importations of French emigrants of all claſſes, this poſition begins to be doubted. If ſtomachic diſeaſes be really more frequent than in other countries, they may more juſtly be aſcribed to our potations of heavy malt liquor, which deſervedly ſtrike foreigners as a ſingularity in Engliſh diet. Even our lighteſt liquors of that ſort have not eſcaped their remark; for a late French traveller has obſerved, that the Engliſh commonly drink at their meals a ſort of medical ptiſan, which they call *ſmall beer.* Our anceſtors prided themſelves in the variety and richneſs of their ales, and old writers enumerate many ſorts, as Cock, Stepney, Stitchback, Hull, Derby, Northdown, Nottingham, Sandbach, Betony, Scurvy-graſs,

MANNERS AND CUSTOMS.

Sage-ale, College-ale, China-ale, Butler's-ale, &c. [1], nor even at present do we refuse praise to the various qualities of our Burton, Dorchester, Taunton, Scottish, and other ales. But the most peculiar malt beverage is porter, which ought to be solely composed of brown or high dried malt, hops, liquorice, and sugar, but is sometimes debased by other ingredients: that of London is particularly famous, and is an article of exportation, being esteemed a luxury on the banks of the Delaware and the Ganges. Punch was another national liquor, composed of spirits, water, acids, and sugar, but its use is now in the decline, though the late Dr. Cullen esteemed it a salutary potation, in a moist and variable climate. The prodigious consumption of tea is another peculiar feature, the use of that plant being rare in other European countries; to phlegmatic constitutions it may be beneficial, but among the common classes, its enervating powers are often attempted to be corrected by the use of spirituous liquors. The latter bane has been long known in Russia, and other northern kingdoms, but in the milder climes of Great Britain and Ireland, is destructive of the health and morals of the people. The legislature has been often forced to interpose to prevent the growth of drunkenness, wretchedness, and vice; and it is to be wished, that a late committee of the house of commons had sanctioned a motion that was made to restrict spirituous liquors to their ancient boundaries, the shops of the chemists. It was objected, that by private distillation and smuggling, the evil would continue, without yielding any revenue; but the prohibition must have made a deep and salutary impression, and the contagion must have been restricted to far narrower bounds. In all events, it is the moral duty of the legislature to increase the price of spirits almost to prohibition, and to withdraw taxation from malt liquor, which ought to remain a stout and cordial beverage for the poor.

The simplicity of the English cookery, strikes foreigners as much as that of the dress, which, even among the great, is very plain, except on the days of court gala. A Frenchman drinks his wine during dinner, but the late Mr. Gibbon has remarked [2], that the luxury of a daily table

[1] Chambers. 191. [2] Posth. Works.

in

in England, permits a gentleman to taste half a dozen sorts of wine during dinner, and to drink his bottle of claret afterwards. The red wine of Portugal is, however, a greater favourite than that of France, as its astringent and antiseptic qualities, are found highly salutary in a moist climate. A late French traveller [1] has remarked, that the English know not the proper use of coffee; but will swallow several cups of a brown water, instead of one cup of the real strong coffee, drank in other countries. MANNERS AND CUSTOMS.

The houses in England are peculiarly commodious, neat, and cleanly; and domestic architecture seems here arrived at its greatest perfection. The dress, as has been before observed, is rather plain and neat, than splendid, a praise which also applies to that of the ladies, who have now abandoned the tight form so prejudicial to health, and have assumed much of the Grecian ease and elegance.

The amusements of the theatre and of the field, and various games of skill or chance, are common to most nations. The baiting of bulls and bears is, it is believed, nearly discontinued; one of the most peculiar amusements of the common people, is the ringing of long peals, with many changes, which deafen those who are so unhappy as to live in the neighbourhood of the church.

Prior to the middle of the sixteenth century, the English and French were regarded as barbarous nations by the more polished Italians. The reign, and female blandishments of the court of Elizabeth, seem to have had a wonderful effect in civilizing the manners. The transition has been well pourtrayed by an ancient writer, whose simple language, given in modern orthography, may perhaps amuse the reader.

" There are old men yet dwelling in the village where I remain, " who have noted three things that are marvelously altered in Eng- " land within their sound remembrance. One is the multitude of " chimnies lately erected; whereas in their young days there were " not above two or three, if so many, in many uplandish towns of the " realm, (the religious houses, and manor places of their lords, always " excepted, and peradventure some great personages,) but each one " made his fire against a *rere dosse* in the hall, where he dined and

[1] St. Fond. Passim.

MANNERS AND CUSTOMS.

" dreſſed his meat. The ſecond is the great amendment of lodging; " for, ſaid they, our fathers, and we ourſelves, have lain full oft upon " ſtraw pallets, covered only with a ſheet, under coverlets made of " *dagſwain* or *hopharlots*, (I uſe their own terms,) and a good round " log under their heads, inſtead of a bolſter. If it were ſo that our " fathers, or the good man of the houſe, had a mattraſs or flock bed, " and thereto a ſack of chaff to reſt his head upon, he thought himſelf " to be as well lodged as the lord of the town, ſo well were they con- " tented. Pillows, ſaid they, were thought meet only for women in " child-bed. As for ſervants, if they had any ſheet above them, it " was well, for ſeldom had they any under their bodies, to keep them " from the pricking ſtraws that ran through the canvas, and raiſed " their hardened hides.

" The third thing they tell of, is the exchange of wooden platters " into pewter, and wooden ſpoons into ſilver or tin. For ſo common " were all ſorts of wooden veſſels, in old time, that a man ſhould " hardly find four pieces of pewter, (of which one was peradventure " a ſalt-ſeller,) in a good farmer's houſe; and yet, for all this frugality, " if it may ſo be juſtly called, they were ſcarce able to live and pay " their rents at their days, without ſelling of a cow, or a horſe, or more, " although they paid but four pounds at the uttermoſt, by the year. " Such alſo was their poverty, that if a farmer, or huſbandman, had " been at the alehouſe, a thing greatly uſed in thoſe days, amongſt ſix " or ſeven of his neighbours, and there, in a bravery, to ſhew what " ſtore he had, did caſt down his purſe, and therein a noble, or ſix " ſhillings in ſilver, unto them, it is very likely that all the reſt would " not lay down ſo much againſt it; whereas, in my time, although " peradventure four pounds of old rent be improved to forty or fifty " pounds, yet will the farmer think his gains very ſmall, toward the " midſt of his term, if he have not ſix or ſeven years rent lying by him " therewith to purchaſe a new leaſe; beſides a fair garniſh of pewter " on his cupboard, three or four feather-beds, as many coverlids, and " carpets of tapeſtry, a ſilver ſalt-ſeller, a bowl for wine, if not a whole " neſt, and a dozen of ſpoons to furniſh up the ſuit. This alſo he " taketh to be his own clear; for what ſtock of money ſoever he ga-

" thereth

" thereth in all his years, it is often ſeen that the landlord will take ſuch " order with him for the ſame, when he reneweth his leaſe (which is " commonly eight or ten years before it be expired, ſince it is now " grown almoſt a cuſtom, that if he come not to his lord ſo long be- " fore, another ſhall ſtep in for a reverſion, and ſo defeat him outright,) " that it ſhall never trouble him more than the hair of his beard, when " the barber hath waſhed and ſhaven it from his chin [1]." Manners and Customs.

This remarkable change in the reign of Elizabeth, was carried, as uſual, to the oppoſite extreme; and the ſame author loudly execrates the contemporary luxury of attire. " I have met," ſays he, " with " ſome in London ſo diſguiſed, that it hath paſſed my ſkill to diſcern, " whether they were men or women." He adds, " neither was it ever " merrier with England, than when an Engliſhman was known by his " own cloth; and contented himſelf with his fine *carſie* hoſe, and a " mean ſlop (trowſers); his coat, gown, and cloak, of brown, blue, " or puce, with ſome pretty furniture of velvet, or fur, and a doublet " of ſad-tawney or black velvet, or comely ſilk; without ſuch gariſh " colours as are worn in theſe days, and never brought in but by the " conſent of the French, who think themſelves the gayeſt men, when " they have moſt diverſity and change of colours about them."

Under this diviſion of geography have been generally arranged what are called national characters, but which, in fact, are commonly monuments of prejudice and injuſtice, and particularly noxious to the minds of youth. It ſhall, therefore, only be remarked, that the cold reſtraint which ſome foreigners have aſcribed to the Engliſh, has been candidly judged by a recent voyager [2], to exiſt only in appearance. A more genuine attribute of the Engliſh is integrity, which has carried their credit and commerce to an extent before unknown in the hiſtory of nations.

Moſt European languages are derived from the Gothic or the Latin. To the Latin origin belong Italian, French, and Spaniſh; to the Gothic, the German, Dutch, Flemiſh, Daniſh, Swediſh, and Norwegian. From the ſituation of the country, and other cauſes, the Engliſh participates of Language.

[1] Deſcription of Britain, in Holinſhed's Chronicle, vol. i. fol. 85. [2] St. Fond, tom. i. p. 61.

both

LANGUAGE. both those grand sources; and unites in some degree the force of the Gothic with the melody of the Latin dialects. The ancient ground, and native expression, originate from the Gothic divisions of the Belgic, Saxon and Danish; but particularly from the Belgic, as will appear from comparison with the Dutch and Frisic. The languages of Latin origin, have, however, supplied a vast wealth of words, sometimes necessary, sometimes only adopted because they are more sonorous, though not so emphatic as the original Gothic. There is no evidence of the existence of Celtic words in our language, whatever some antiquaries have imagined, for the words they indicate may also be found in Iceland, a country never peopled by the Celts.

Numerous manuscripts exist, written in the Anglo-Saxon, or Old English language, and one of its most classic authors, is the great Alfred himself. It appears from many works, written long after the conquest, that the French language, though colloquial among the great, scarcely imparted any tinge to the national tongue. The conquests of Edward III, in France, and other circumstances not proper to be here discussed, effected in the fourteenth century, a change in vain attempted by the Norman conqueror. Chaucer, who wrote at that period, presents almost the first rude dawn of what may be termed the English language. In the same century, that enterprising traveller, Sir John Mandeville, supplies one of the first specimens of English prose: as he was a man of some science for that time, has interspersed several words of Latin origin; and his book was much adapted to public curiosity, he may with some justice be regarded in the new light of a father of the English language. Gower, the poet, rather preceded Chaucer; and serves to evince, that Chaucer did not introduce any innovations, but, as may well be supposed, wrote in the language of his time.

In the succeeding century, the speech had made such rapid advances, that even as early as the reign of Henry VI, we find it vary very little from that of the reign of Henry VIII. There are papers preserved by Rymer, and others, written in the reign of Henry VI, and composed with a force and precision which may appear surprising. The works of Fortescue, in the following reign of Edward IV, are not only dictated

dictated by excellent ſenſe; but, ſetting aſide the orthography, might even be peruſed by the common reader. LANGUAGE.

In the reign of Elizabeth, a century after, the Engliſh language had acquired ſuch copiouſneſs, dignity, force, and melody, that, perhaps, in the eye of very diſtant poſterity, moderns may be ſuppoſed never to have exceeded; what is gained in elegance, being generally loſt in power. Sydney's defence of poeſy, may be regarded as a good ſpecimen of Engliſh proſe; not to mention Hooker's Eccleſiaſtical Polity, and other large works of that period, which continue to be read and admired. The common tranſlation of the Bible, is a noble ſpecimen of the dignified proſe of the following reign; beyond which it is unneceſſary to conduct this ſketch, as our libraries abound with the ſucceeding publications.

The conſtruction of the Engliſh language is peculiar, and renders the ſtudy of it very difficult to foreigners. The German, and other Gothic dialects, preſent declenſions of nouns, and other correſpondencies with the Latin; while in the Engliſh all ſuch objects are accompliſhed by prefixes. Anomalies alſo abound, and are too deeply rooted, ever to be eradicated by grammatical rules. Further remarks would be foreign to the plan of this work, which however requires occaſionally ſhort ſpecimens of the various languages of the globe, to enable the reader to judge of the relative origins of nations: for this purpoſe the Lord's Prayer is generally choſen, which ſhall here be given in Anglo-Saxon, and in modern Engliſh.

Uren fader thic arth in Heofnas. Sie gehalgud thin noma. To cymeth thin Ryc. Sie thin willa, ſue is in Heofnas and in eortho. Uren hlaf oferwiſtlic fel us to daeg. And forgeve us ſcylda urna ſue we forgefan ſcyldgum urum. And no inlead uſig in cuſtnung. Ah gefrig uſich from iſle. Amen.

Our father which art in heaven, hallowed be thy name; thy kingdom come; thy will be done on earth as it is in heaven; give us this day our daily bread, and forgive us our debts as we forgive our debtors; and lead us not into temptation, but deliver us from evil. Amen.

Engliſh literature is a vaſt and inviting theme, but a few fugitive remarks muſt here ſuffice. Of the traditionary verſes of the Druids, no relic probably exiſts; and the Roman conqueſt does not appear to have inculcated letters with much diffuſion, for while we have claſſical Literature.

writers

LITERATURE writers of almoſt every other European kingdom, ſubdued by that great nation, of France, Spain, and even of Africa; no author of thoſe periods claims a Britiſh origin. The country was ſeized by the Saxons before Britiſh literature faintly dawned in Gildas, A. D. 560. Iriſh literature commences about the ſame period, and continued for ſome centuries, to ſupply numerous writers in the Latin language, while England remained almoſt deſtitute. But Beda, in the eighth century, redeemed this defect, in himſelf a hoſt, and, like Chaucer, the wonder of his time. The Daniſh invaſions were ruinous to literature, both in Great Britain and Ireland, and the great Alfred was obliged to exert his utmoſt endeavours, in order to reſtore ſome degree of learning, even among the clergy. That admirable prince did not aſpire to Latin compoſition, but tranſlated ſome works of merit and utility, as the hiſtories of Oroſius and Beda, into the Anglo-Saxon. Aſſerius is perhaps the only Latin writer, who can be named between the age of Bede and the year 1100, if we except a few lives of ſaints: but the Saxon Chronicle is a noble and neglected monument of this interval, which being the only civil Hiſtory of England, for a ſpace of 400 years, ought to be carefully collated with all the manuſcripts, and publiſhed with all the ſplendour of typography. About the year 1100, Engliſh literature commences a firm and ſteady pace. A numerous train of hiſtorians, poets, and other writers, fills the pages of biography. In the fourteenth century Roger Bacon aſpires even to the praiſe of eminent genius. In the following century, the civil wars between the houſes of York and Lancaſter, were deſtructive of literature and the arts; nor will it be eaſy to name an illuſtrious author of that period, but the introduction of printing in the reign of Edward IV, forms a memorable epoch. The writers of the ſixteenth, and following centuries, are numerous and well known.

On a comparative view of European literature, it may be obſerved that the Italians, its firſt reſtorers, excel in poetry, hiſtory, and other departments of the Belles Lettres; but about the year 1600, their taſte began to decline, and a mental effeminacy aroſe, which is conſpicuous in the fantaſtic ſocieties and academies, and in the extravagant flatteries which every writer thought due in politeneſs to another; the

term *illuſtrious* becoming as familiar as that of *Signior* and *Madama*, a waſte of literary fame, which rendered it of no value. The French even originally excelled in romance and light poetry, and that pleaſing and minute ſpecies of biography, called memoirs; they have produced few works of original genius, but yield to no nation in ſcientific productions, and in literary diſquiſitions, written with good ſenſe, preciſion, and accuracy. Spaniſh literature forms a vaſt treaſure, little known to other nations; and ſcarcely any department can be named, in which excellent writers do not appear. The native German, Daniſh, and Swediſh literature, is but of recent celebrity. To complete the ſole intention of this parallel, the grand feature of Engliſh literature, is original genius, tranſmitted even from Roger Bacon, to our Shakeſpeares, Miltons, Newtons, and Lockes, not to dwell here on claims more minute, but equally firm. In the ſcientific departments, England muſt yield to France, except in the various branches of mathematical knowledge, the inſtitution of the Royal Society, and the genius of Newton, having attracted the greateſt talents within their ſphere, to the neglect of other departments of curious inveſtigation. The Engliſh clergy, who far exceed in learning any other body of that deſcription in Europe, have always cultivated claſſical literature, with diſtinguiſhed zeal and predilection. LITERATURE.

An old writer obſerves, that during the civil war under Charles I, there were "more good, and more bad books, printed and publiſhed in "the Engliſh tongue, than in all the vulgar languages of Europe[6]." Perhaps Germany may now exceed our literary efforts; yet more novels are ſuppoſed to be publiſhed in England in one month, than in all the reſt of Europe in a year. Our literary journals, in which we may alſo claim a great degree of excellence, may indicate to foreigners, the vaſt extent of modern Engliſh literature.

The preſent ſtate of the arts in England, is worthy of ſo opulent and refined a country, and the progreſs has been rapid beyond example. The late Horace Walpole, Earl of Orford, has delineated from the papers of the induſtrious Vertue, a pleaſing and animated picture of the hiſtory of the arts in this country. Some faint traces of painting

[6] Chamberl. 191.

LITERATURE.

occur in the thirteenth century; but the names and country of the artists do not appear, except that of William of Florence, where the art had faintly begun to revive. In the reign of Edward I, the magnificent castles built in Wales, attest the genius and skill of the architects, while their individual fame is lost in obscurity; and towards the end of the fourteenth century, rich monuments of architecture and sculpture, are interspersed with some few remains of painting. The Missals in particular, and other manuscripts, begin to be illuminated or adorned with miniature paintings of great lustre; and as the Gothic architecture is by some conceived to have originated from the shrines for relics, so the larger paintings seem mere amplifications of the manuscript miniatures. But while the neighbouring Flanders began to display many native names, England continued, till the last century, to import her chief painters from abroad, as Holbein, Antonio More, Zucchero, Jansen, Mytens, Rubens, Vandyke, Lely, Kneller, &c. &c. Yet in miniature and engraving, there were excellent native artists in the seventeenth century; and in the beginning of that century, an eminent native architect, Inigo Jones. In the beginning of the eighteenth century, even the noble architecture of St. Paul's, did not redeem the other arts from great decline, till Hogarth instituted examples of ethic and characteristic painting, which have deservedly excited the admiration of Europe. His fame as an artist has been eclipsed by his inventive genius, but his pictures of Marriage à-la-Mode, and many others, are finished with a care, minuteness, and harmony, worthy of an eminent Dutch master. The present reign has not only been distinguished by patronage of the arts, but been fortunate in exuberance of artists of deserved reputation. To enumerate the living might be invidious, or occasion suspicions of partiality, but among the deceased may be named Sir Joshua Reynolds, eminent in history and portrait, and by his scientific disquisitions on the art; Gainsborough and Wilson in landscape, &c. &c. Though in the seventeenth century, Faithorne, and one or two others, shewed great skill and spirit in engraving on copper, yet our chief artists, even in the eighteenth century, were French, till the national fame was raised by Strange, Woollet, Worldige, and others, who have been succeeded by such a number

number of excellent artiſts in this department, that England excels every country, and the prints executed in London attract univerſal admiration and imitation. Architecture and Sculpture now alſo boaſt of many diſtinguiſhed native names; but in muſic we ſtill revere the ſuperior ſkill of the Germans and Italians, though our maſters far excel thoſe of any other country, and France in particular, where, however the horrible diſcords faſhionable for 200 years, begin at length to yield to the German and Italian taſte. LITERATURE.

In a view of any country, education forms one of the moſt important topics, as its conſequences extend to the eſſence and well-being of the community. The education of the lower claſſes in England, had become extremely neglected, before the benevolent inſtitution of the Sunday ſchools. There can be no doubt that where the common people are the beſt inſtructed, there they will be found the moſt quiet, contented and virtuous; as they feel a conſcious ſelf reſpect, are accuſtomed to be treated with regard by each other, and will cheerfully extend the ſame reverential conduct towards their ſuperiors in the favours of fortune. Political theories, being founded merely on analogical reaſoning, and no two caſes, climes, nor countries, being preciſely ſimilar, they become very hazardous in experiment; but a practical eſtimate of the advantages of general education, may be formed by comparing the neglected peaſantry of Ireland, with the peaceable Highlanders of Scotland, where public ſchools exiſt in every pariſh. The middle and higher ranks of Engliſh, ſpare no expence in the education of their ſons, by private tutors at home, or at what are called day-ſchools and boarding ſchools. The former kind in which the maſter only attends to mental culture, ſeems preferable to the latter, which requires additional cares of the child's health, diverſions, and conduct. Our moſt eminent public ſchools, are thoſe of St. Paul's, Weſtminſter, Eton and Wincheſter; and from them have ariſen ſome of the moſt diſtinguiſhed ornaments of their country. The ſcholars in due time proceed to the univerſities of Oxford and Cambridge, foundations of an extent and grandeur that impreſs veneration. The number and æra of the colleges will appear from the following liſt. Education. Univerſities.

EDUCATION.

University of Oxford.

1263. Baliol College.—Founder, John Baliol, (father of John, King of Scotland,) and his wife, Dervorgilla, Countess of Galloway.
1276. Merton College.—Walter Merton, Bishop of Rochester.
1292. University College.—William, Archdeacon of Durham [1].
1316. Exeter College.—Walter Stapleton, Bishop of Exeter.
1323. Auriell College—Adam de Brome, Almoner to Edward II.
1340. Queen's College. -Robert Eglesfield, Chaplain to Queen Philippa.
1379 New College. —William of Wickham.
1438. All Souls.—Archbishop Chicheley.
1458. Magdalen College. - William of Wainflet.
1613. Brazen Nose.—William Smith, Bishop of Lincoln.
1516. Corpus Christi. - Richard Fox, Bishop of Winchester.
1539. Christ's Church.—Wolsey and Henry VIII.
1556. Trinity College. - Sir Thomas Pope.
1557. St. John's.—Sir Thomas White.
1571. Jesus College.—Dr. Price.
1613. Wadham.—Nicholas Wadham, Esq.
1624. Pembroke.—Thomas Tesdale, Esq [2].

There are besides several halls, or smaller colleges, and some recent foundations. The laudable favour of the Oxonians, adores Alfred as the founder of what is called the university college, and even assigns the date of 886; but candid antiquaries assert, that the passage in one or two old Chronicles, alledged in support of this idea, is a manifest interpolation, not to be found in the best manuscripts: and though great schools of divinity may have previously existed at Oxford, such were also known at other places, which lay no claim to the title of university.

University of Cambridge.

1284. Peter-house.—Hugh Balsham, Bishop of Ely.
1340. Clare hall. -Elizabeth de Burg, Countess of Ulster.
1347. Pembroke-hall.—Mary de Valentia, Countess of Pembroke.
1348. and 1557. Gonville and Caius.—The Doctors so named.
1353. Trinity-hall —William Bateman, Bishop of Norwich.
1356. Bennet, or Corpus Christi.—Henry Duke of Lancaster.
1443. King's College.—Henry VI.
1446. Queen's College. —Margaret of Anjou.
1474. Catherine-hall.—Dr. Woodlark.
1497. Jesus College.—John Alcock, Bishop of Ely.
1516. Christ's College, } Margaret, Countess of Richmond, Mother of Henry VII.
1511. St. John's }
1520. Magdalen College.—Thomas, Lord Audley.
1546 Trinity College. - Henry VIII.
1589 Emanuel.—Sir Walter Mildmay.
1588 Sydney College. Frances Sydney, Countess of Sussex [3].

[1] Gough's Cam. I. p. 302, &c. [2] Ibid. [3] Ibid. II. 124. 131. Gray's Poems, Notes.

Of

Of the two univerſities many minute deſcriptions have appeared. Oxford is the more majeſtic, from the grandeur of the colleges, and other public buildings, and the ſuperior regularity and neatneſs of the ſtreets; but the chapel of King's college, at Cambridge, is ſuppoſed to excel any ſingle edifice of the other univerſity. Both of thoſe magnificent ſeminaries impreſs every feeling mind with reverential awe, not only by their architectural dignity, but by a thouſand collateral ideas of ancient greatneſs and ſcience. EDUCATION.

To attain the degree of bachelor of arts, a reſidence of twelve terms, or three years, is neceſſary at Cambridge, four at Oxford. In both univerſities, three years more muſt elapſe, before the ſtudent can commence maſter of arts; after which ſeven years are required before he can become bachelor of divinity; and four more for the doctor's degree. That of doctor of laws may be acquired in ſeven years after he is declared maſter of arts.

Female education is conducted in England with great elegance and expence. Even in the middle ranks of life, young women are generally taught muſic and drawing, a plan which ſurpriſes foreigners, who ſeldom teach theſe arts, except in caſes of decided propenſity. They are, indeed, of little or no uſe in future life; but they enlarge and cultivate the mind, and ſerve to prevent the dangers of idleneſs.

In giving a brief account of the chief cities and towns in England, a few of the moſt important ſhall be arranged according to dignity, opulence, and population; and the others ſhall be ſtated without preference, in a kind of progreſs from the ſouth-weſt to the north. Cities.

London, the metropolis of England, and perhaps the moſt populous and rich city on the face of the globe, is ſituated in an extenſive plain, or valley, watered by the Thames, and only confined on the north by a few ſmall elevations; being a place of great antiquity, and firſt mentioned by Tacitus. It was in former times of far leſs extent, and ſurrounded with walls, but now includes Southwark, in itſelf a city, on the other ſide of the Thames, and Weſtminſter, another city on the weſt; ſo that like ſome places of ancient geography, it might be named *Tripolis*, or three cities. The noble river Thames is here about 440 yards in breadth, and is crowned with three bridges, the moſt ancient London.

of

Cities and Towns.

of which was formerly covered with houſes and ſhops, now removed; but the inconveniences it preſents to navigation, cannot be ſo eaſily remedied. The Thames is crowded with a foreſt of maſts, and conveys into London the wealth of the globe, forming an excellent port, without the danger of expoſure to maritime enmity. It is, however, a great defect, that inſtead of open quays and ſtreets, on the banks of the ſtream, the view is obſtructed, on both ſides, by irregular maſſes of building, which do not even admit of a path. London preſents almoſt every variety which diverſifies human exiſtence; upon the eaſt it is a ſea-port replete with mariners, and with the trades connected with that profeſſion. In the centre it is the ſeat of numerous manufactures, and prodigious commerce; while the weſtern, or faſhionable extremity, preſents royal and noble ſplendour, amidſt ſcenes of the higheſt luxury, and moſt ruinous diſſipation.

Few cities can boaſt a more ſalubrious ſituation, the ſubjacent ſoil being pure gravel, by which advantage, united with extenſive ſewers, the houſes are generally dry, cleanly, and healthy. Proviſions and fuel are poured into the capital, even from diſtant parts of the kingdom, the latter article being coals, from the counties of Northumberland and Durham, tranſferred by ſea, and thence denominated ſea-coal[6]. The ſmoke is eſteemed to purify the dampneſs of the air, but injures the beauty of the edifices; the ſublime architecture of St. Paul's for inſtance, being obſcured by ſable weeds. London requires in one year 101,075 beeves, 707,456[7] ſheep, with calves and pigs in proportion: the vegetables and fruits annually conſumed in the year, are valued at a million ſterling[8].

The population of London has by ſome been exaggerated to a million of ſouls; but by the moſt recent and authentic accounts, it contains about eight hundred and ſixty thouſand[*]. Its length from Hyde-park

[6] Mr. Middleton, in his View of Middleſex, 1789, ſuppoſes that half a million of chaldrons are yearly conſumed in that county. Stewart on Coal, p. 191, ſays 866,167. [7] Ib. 411.

[8] Ibid. 267. Mr. Pennant, Brit. Zool. iv. 9. ſays, 60,000 lobſters are annually brought to London, from near Montroſe.

[*] Including the pariſhes not within the bills of mortality; that is Mary-le-bone, Paddington, St. Pancras, Kenſington, and Chelſea, amounting to 117,802. Iſlington and Newington Butts are within the bills.

Corner

Corner on the weſt, to Poplar on the eaſt, is about ſix miles; the breadth unequal, from three miles to one and leſs; the circumference may be about ſixteen miles. The houſes are almoſt univerſally of brick, and diſpoſed with inſipid ſimilarity; but in recompence, moſt of the ſtreets are excellently paved, and have convenient paths for foot-paſſengers, a mark of reſpect to the common people, almoſt unknown to the capitals on the Continent. Another national feature, is the abundance of charitable foundations, for almoſt every infirmity and diſtreſs incident to human nature. The multitude and rich diſplay of the ſhops impreſs ſtrangers with aſtoniſhment, nor are they leſs ſurprized at the conſtant torrent of population rolling through the principal ſtreets, nor at the ſwarm of carriages at all times crowding all the roads to the capital, and the nocturnal illuminations which extend even to four or five miles of the environs. Though the impreſſion of the tide be felt as far as Staines, the Thames at London, and a conſiderable way below, is untainted with ſalt. Its waters are raiſed by machinery, and conducted in innumerable pipes for domeſtic uſes, while the parts more remote are ſupplied with water from ſome ſmall ponds near Hampſtead, and from that laudable work of Middleton, the New River, which conveys a copious addition from the north. The water of the Thames is ſaid to impart peculiar qualities to the liquor called porter; but this idea perhaps only tends to ſtrengthen the monopoly of the London brewers.

CITIES AND TOWNS.

The environs of London preſent a ſpectacle almoſt as grand and intereſting as that of the metropolis itſelf. Extenſive ſtreets of villas and houſes, are continued in almoſt every direction, within ſeven or eight miles. Yet few of the public edifices in London can pretend to much magnificence. The cathedral of St. Paul's forms one of the chief exceptions; the exterior architecture of this principal cathedral of the proteſtant faith, being majeſtic to a degree of ſublimity, but the interior is defective in decoration. The tombs recently ordered, in imitation of thoſe at Weſtminſter, will contribute to obviate this remark. In the colonnade, fountains, &c. it yields to St. Peter's at Rome; and, in general, the public edifices of London are in diſadvantageous poſitions, without proper avenues or points of proſpect. It is ſurpriſing that fountains, or

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jets d'eau, which ſo much diverſify the ornaments of a city, though in a garden they be puerile, ſhould be almoſt unknown in London, except a diminutive ſpecimen in one of the courts of the Temple. Weſtminſter-abbey may claim the next rank to St. Paul's cathedral, being not only in itſelf a grand impreſſive edifice, of the Gothic claſs, but as being the ſactuary of the illuſtrious dead, of all ranks, periods, and profeſſions, from the victorious monarch down to the humble pedagogue. It was founded by Sebert, King of the Eaſt Saxons; was afterwards ruined by the Danes, and re-founded by Edward the Confeſſor, whoſe tomb is the moſt ancient now remaining. The preſent edifice was the work of Henry III; and Henry VII added an elegant chapel, and his tomb, the work of Torrigiano; in the vaults under this chapel the late monarchs and their offspring have been depoſited. The body of the edifice is crowded with illuſtrious tombs, decreed by the nation, or erected at the expence of individuals; this part is open to general inſpection; and others more retired, are diſplayed by the attendants for a trifling remuneration. Adjacent are the two houſes of parliament, and Weſtminſter-hall, a vaſt room, 230 feet long, and 70 wide, with a curious cieling of Iriſh oak, and apartments on the ſide, in which are held the principal courts of juſtice.

The churches and chapels exceed 200 in number, and a few are of beautiful architecture. Some are the productions of Inigo Jones; as is alſo the noble banqueting-houſe at Whitehall, with a maſterly cieling painted by Rubens, repreſenting the apotheoſis of James I.

Near London-bridge, a pillar of 193 feet elevates his bold front above moſt of the ſpires, and is called the Monument, being deſtined to commemorate the conflagration of London, in the reign of Charles II. The Tower is only venerable from ancient fame; and remarkable for the curioſities which it contains. The new edifice erected by the Company trading to the Eaſt Indies, has a conſiderable degree of elegance, and ſome of the halls of the companies have a reſpectable appearance. The Bank is a ſtructure of the Ionic order, more remarkable for intrinſic wealth than exterior magnificence. The architecture of the priſon called Newgate is ſingularly appropriate. Somerſet Houſe

presents an elegant specimen of recent architecture, but may, perhaps, in future times be found as deficient in solidity as it is at present inconvenient in the height and steepness of the stairs, and in some other respects. The terrace of the Adelphi is a pleasing piece of architecture, and presents an interesting prospect of the river. The Pantheon is an elegant edifice, resembling that at Rome, but dedicated solely to public amusements. The royal palace of St. James's is an irregular building, of very modest aspect. The queen's palace, formerly Buckingham-house, only aspires to elegant convenience, but contains some valuable paintings, and an excellent library, formed solely by the taste of the reigning monarch. The palace of Kensington presents an exuberance of valuable pictures, little known, and rarely visited. The houses in the West end of the town, of themselves shew the gentle gradations of rank in England, those of the chief nobility being rarely distinguishable from the others; the more remarkable are, Foley-house, the Duke of Manchester's; the late Mrs. Montague's, in Portman square; Chesterfield-house; Lord Spencer's, in the Green-park; Marquis of Lansdowne's, Berkeley-square; Duke of Northumberland's at Charing-cross; Burlington-house, with a fine colonnade behind the front wall, and those of the Duke of Devonshire and the Earl of Bath, all in Piccadilly; nor must Cumberland-house and Carleton-house, in Pall-Mall, be forgotten. Cities and Towns.

Next to the capital in dignity, though not in extent nor opulence, is York, which is not only the chief city of a large and fertile province, but may be regarded as the metropolis of the North of England. The name has been gradually corrupted from the ancient Eboracum, by which denomination it was remarkable even in the Roman times, for the temporary residence and death of the Roman Emperor, Severus. This venerable city is divided by the River Ouse; and the Gothic cathedral is of celebrated beauty, the western front being peculiarly rich, the chief spire very lofty, and the windows of the finest painted glass. York divides with Edinburgh the winter visits of the Northern gentry. York.

But Liverpool, in Lancashire, is now generally allowed to approach the nearest to London in wealth if not in population, being the seat of a vast commerce, which has been continually on the increase, since the beginning of this century, when it was merely a village. It is first mentioned Liverpool.

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tioned in the reign of William the Conqueror: yet in Leland's time, was not even a parish, but had only a chapel, the parish-church being that of Walton. In 1699, Liverpool was admitted to the high honour of being constituted a parish. In 1710 the dock was constructed; and the chief merchants came originally from Ireland, a circumstance which has given a distinct tinge to the manners of the town. Thenceforth the progress was rapid, and in 1760 the population was computed at 25,787 souls[9]. In 1773 they amounted to 34,407, in 1787 to 56,670: at present they may be computed at between 70 and 80,000. By the parliamentary enumeration they are 77,653.

The number of ships which paid duty at Liverpool, in 1757, was 1371; in 1794 they amounted to 4,265. In the African trade, a distinguishing feature of Liverpool, there was only one ship employed in 1709; in 1792 they amounted to 132. It was computed, that between the end of August 1778, and that of April 1779, Liverpool sent out no less than 170 privateers[10]. In the recent act for the contribution of seamen to the royal navy, according to the ships registered in each, the estimate is as follows:

London,	5725	Hull,	731	Bristol,	666
Liverpool,	1711	Whitehaven,	700	Whitby,	573
Newcastle,	1240	Sunderland,	669	Yarmouth,	506.

Bristol.

Bristol is still a large and flourishing city, though much of its commerce with the West Indies and America have passed to Liverpool. This metropolis of the West of England gradually rose to eminence in the Anglo-Saxon period; and was so flourishing and opulent in the reign of Henry II, that, besides other charters, he granted the possession of Dublin in Ireland; and a colony from Bristol was accordingly transplanted[11]. The trade with Ireland has continued chiefly to center in this city: even in that reign, as ancient writers inform us, the port of Bristol was replete with vessels from Ireland, Norway, and other parts of Europe. Bristol is pleasantly situated at the confluence of the Froome with the Avon. Besides the cathedral, there is a large church of Gothic construction, that of Redcliffe, founded in the thirteenth century, and improved and repaired by Canyng or Canyngs, an opulent merchant of the fifteenth century, celebrated by William of Wor-

[9] Aikin's Man. 333. et seq. [10] Ibid. 364. 371. [11] Barrett's Bristol, 49. 57.

cester.

cester [a]. In the treasury room of this church, is an ancient chest, the source ascribed to several literary forgeries. The hot-wells in the neighbourhood appear to have been known in 1480; but the water was chiefly used externally, till about the year 1670, when a baker dreaming that his diabetes was relieved by drinking the water, he tried the experiment, and recovered [b]. Since that period its reputation has increased, and many commodious and elegant erections have contributed to recommend these wells to invalids. In the adjacent rocks are found beautiful crystals, which, before the introduction of artificial gems, were greatly in fashion for female ornaments. The trade of Bristol is chiefly with Ireland, the West Indies, or North America, Hamburgh, and the Baltic; that with Guinea, not the most laudable, is resigned to Liverpool. By the navigati of the two rivers Severn and Wye, Bristol also engrosses most of the trade of Wales. In 1787, Bristol employed about 1600 coasting vessels, and 416 ships engaged in foreign commerce [c]. Inhabitants about 68,645. Cities and Towns.

The proximity may here authorize the mention of Bath, esteemed the most elegant town in England. The hot-baths, from which it derives its name, were known in the Roman times, nor was their celebrity lost even in the dark period of Anglo-Saxon history. But the town has been greatly enlarged and decorated in the last century. The waters are used both internally and externally, chiefly in gouty, bilious, and paralytic cases, being frequented at two times in the year, what is called the spring season, from April to June, and the autumnal from September to December. Two thirds of the Company are attracted merely by amusement, society, and dissipation, in all which it is only second to London. Situated in a vale, Bath is very hot in summer. The houses are constructed of white stone, which abounds in the vicinity. Bath.

But next to Bristol in point of opulence, must be classed the towns of Manchester, Birmingham, and Sheffield.

Manchester, in Lancashire, was known in the Roman times under the name of Mancunium, a small Roman station; but it continued in obscurity till the time of Elizabeth [d], when Camden mentions its manufacture of woollen-cloths, then called *cottons*. During the civil wars Manchester.

[a] Barrett's Bristol, 573. 627. [b] Ibid. 93. [c] Ibid. 190. [d] Aikin's Man. 149.

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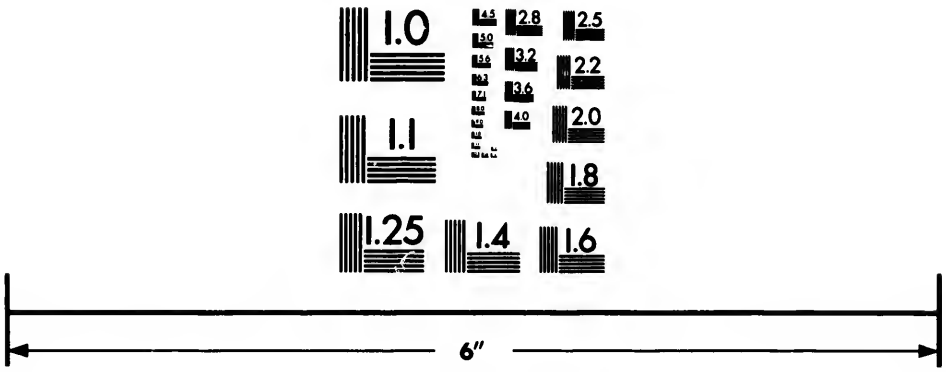

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Cities and Towns.

under Charles I. Manchester remained in the hands of the Parliament. In 1708, the inhabitants were only computed at 8000. In 1757, they fell short of 20,000, at present they amouut to 84,020 this being the next city after London in population. The cotton manufactures of Manchester are sufficiently known over Europe; and the machinery, greatly indebted to the genius of an Arkwright, excites astonishment at the progress of human art and industry[16].

Birmingham.

Birmingham, in Warwickshire, was originally a village, belonging to a family of the same name, whose monuments remain in the old church. Leland mentions it as a town inhabited by smiths and cutlers, in the time of Henry VIII.; and by lorimers, now called bit-makers. The extension and improvement of Birmingham originated in a great degree from Mr. John Taylor, who introduced the manufacture of gilt buttons, and japanned and enamelled works; but the toy manufacture was known in the reign of Charles II. The great fabric, called Soho, belonging to Messrs. Boulton and Watts, is situated about two miles from Birmingham, but in Staffordshire. Between the year 1741 and 1790, Birmingham had received an augmentation of seventy-two streets, 4172 houses, and 23,320 inhabitants[17]; the present population is computed at 73,670.

Sheffield.

Sheffield, in the most southern part of Yorkshire, is styled by Leland the chief market-town in Hallamshire (for in the North, many particular districts usurp the name of shires). The company of cutlers of Hallamshire, was established by act of parliament in 1625; but Sheffield had been distinguished for a kind of knives, called whittles, and other articles of cutlery, as early as the thirteenth century; yet, till within the last half century, the manufactures of Sheffield were conveyed weekly to the metropolis, on pack-horses. In 1751, the river Don was rendered navigable to within two miles of the town, which facilitated the export. The plated goods commenced about 1758. In the year 1615, the population only amounted to 2152; in 1755 to 12,983; in 1789 about 30,000. At present the population may be about 45,000[18].

[16] Aikin's Manchester, 149. 156.
[17] Hutton's Hist. of Birmingham.
[18] Aikin's Man. 539. et seq.

The

The other chief towns in England, not aſpiring to ſuch pre-eminence, though ſeveral be of far more importance than others, ſhall be claſſed, as before mentioned, in a kind of geographical order, beginning at the South-weſt, and proceeding to the North. Cities and Towns.

Falmouth, in Cornwall, the moſt weſterly port in England, is chiefly remarkable for the arrival and diſpatch of packet boats; but Exeter, in the adjacent county of Devon, is an ancient and reſpectable city. It is the ſeat of an extenſive commerce in coarſe woollen goods, manufactured in a part of Somerſetſhire, and in Devon and Cornwall[19]. They are exported to Italy, and other parts of the Continent, to the annual value, as is ſuppoſed, of 600,000*l.*, and the Eaſt India Company purchaſe yearly to a conſiderable amount. Beſides the native wool of the above-mentioned counties, Exeter imports from Kent about 4000 bags a-year. Some ſhips are alſo occupied in the cod-fiſhery of Newfoundland, and in the Greenland capture of whales. The imports are from Spain, Italy, Hamburgh, and the Baltic; and coals from the North of England and Wales. It is, moreover, the reſidence of many genteel families; and the frequent reſort of others from the neighbouring counties. Falmouth. Exeter.

Plymouth is a celebrated port with a population of 43,194. Plymouth.

Dorcheſter, the chief town of the county of Dorſet, is a place of conſiderable antiquity, ſituated on the river Frome; but has no manufactures, and is only celebrated for its malt liquor. Dorcheſter.

Saliſbury, the principal town of Wiltſhire, is chiefly remarkable for extreme neatneſs, and for its cathedral, a beautiful piece of Gothic architecture, with the loftieſt ſpire in England, the height being 400 feet. There is a manufacture of flannels, and another of cutlery goods and hardware, the ſuperiority of the ſciſſars being particularly noted. Wilton, in the ſame county, is famed for the manufacture of beautiful carpets. Saliſbury.

Wincheſter, the chief city of Hampſhire, was for many centuries, the metropolis of England, a pre-eminence which it did not wholly loſe till the thirteenth century[20]. The port was Southampton, but the ſupe- Wincheſter.

[19] Aikin's Engl. delineated, p. 335. [20] Milner's Wincheſt.

rior

Cities and Towns.

rior ſafety and convenience of that of London, gradually reſtored the latter to that metropolitan dignity which it held in the Roman period. Wincheſter remains a venerable city, with many veſtiges of ancient fame and ſplendour. It is ſituated in a bottom, amid open chalky downs, upon the ſmall river Itchyn. The cathedral rather impreſſes the idea of majeſtic gravity, than of magnificence; and has no ſpire, having been erected before that mode of architecture was uſed. The aſh es of ſeveral Saxon monarchs are here preſerved with reverence. Not far from the cathedral ſtands the celebrated college, founded by William of Wickham, and which has ſent forth many illuſtrious characters. The regulations of this ſchool are, in ſome inſtances, peculiar and ſevere; but in this, and the other grand Engliſh ſeminaries, the equality of the pupils, except in reſpect of age and abilities, and even the ſubſerviency in which the younger are held by the elder, tend to ſteel and fortify the mind againſt the ſubſequent cares and emulations of life. In the center of the city is a ſmall, but moſt elegant Gothic croſs; and at the weſtern extremity is the ſhell of a palace, built under the direction of Sir Chriſtopher Wren, yet heavy and inelegant; it was begun by Charles II, but left unfiniſhed at his death. It has ſince been uſed for French priſoners, and in 1796 was the reſidence of about 640 emigrant prieſts from France.

Portſmouth.]

In the ſame county is ſituated Portſmouth, the grand naval arſenal of England. The harbour is noble and capacious, narrow at the entrance, but ſpreading out into an inland bay, five or ſix miles in length, and from two to four in breadth. The advantages derived from nature have been improved by the art and induſtry of ſucceſſive generations; and to a patriot, Portſmouth preſents one of the moſt intereſting ſcenes to be found in the Britiſh dominions. The regular fortifications towards the land, in themſelves happily a novelty to the Britiſh eye; the magnitude and variety of the maritime objects and manufactures, and the proſpect of Spithead, the grand focus of naval armament, conſpire, with a thouſand relative ideas concerning the power of England, ſupreme in every ſea, to excite our aſtoniſhment and exultation.

Lewes.

Lewes is eſteemed the chief town of Suſſex; the ſituation is lofty and picturesque, eſpecially the ſite of the ancient caſtle, belonging to the

the powerful Earls of Warren and Suſſex. Beneath, in a pleaſant plain, watered by the River Ouſe, ſtand the ruins of an ancient nunnery. Cities and Towns.

Chicheſter retains ſome little traffic. Brighthelmſtone is a faſhionable reſort for the ſea air and bathing; an extenſive beach extends four miles under lofty cliffs, and on the other ſide are wide open downs, compoſed of numerous verdant hills, diverſified with winding cavities: towards Shoreham are ſome pits of a kind of bitumen, which might, perhaps, be uſed in ſome manufacture. When dried and rolled by the waves, it forms balls of various ſizes, frequent on the beach, and formerly uſed as fuel by the poor, though ſince forbidden, on account of the noxious ſmell. Brighthelmſtone not only preſents the neareſt open ſhore to the capital, but is diſtinguiſhed for the peculiar mildneſs and ſalubrity of the air. Brighthelmſtone.

Canterbury, the chief town of Kent, and the metropolis of the Engliſh church, is chiefly remarkable for eccleſiaſtical antiquities; and the county town is Maidſtone, noted for hops and thread. Kent preſents many other important towns, as Deptford, Greenwich, Woolwich, Gravesend, Chatham, Rocheſter, and the faſhionable reſorts of Margate, Ramſgate, and Tunbridge. Dover and Deal are remarkable havens. Canterbury.

Having completed this brief ſurvey of the chief towns to the ſouth of the Severn and the Thames, thoſe of the middle and northern counties may be again commenced from the weſt.

Hereford, the capital of a county bordering on Wales, was known in the Saxon times as an epiſcopal ſee. The caſtle ſuppoſed to have been founded in the reign of the Confeſſor, is on the left bank of the river Wye. The cathedral is large, but the town preſents little remarkable, having gone into great decay: the only manufacture is that of gloves [21]. Hereford.

Glouceſter, the capital of the county ſo called, is admired for the regularity of the four principal ſtreets, joining in the center of the town. It avails itſelf of the traffic of the Severn, which, among other fiſh, affords a luxurious ſupply of lampreys. This town has been recently celebrated for its neatneſs, and the cheapneſs of proviſions. Glouceſter.

[21] Gough's Camden, ii. 450.

Worceſter

Cities and Towns. Worcester.

Worcester is also situated on the noble river Severn, over which there is a beautiful bridge. The manufactures are chiefly gloves and woollen stuffs; and the porcelain maintains a high reputation.

Coventry.

On the East, the first town of note is Coventry, esteemed the most inland and centrical of the English towns, whence, perhaps, the military phrase of sending a man to Coventry, where he would be the most remote from service. The manufactures are chiefly ribbons, with a few gauzes and camlets. The beautiful cross, erected in 1541, after being much damaged by the lapse of years, has been taken down [22].

Norwich.

The next memorable town is Norwich, the capital of Norfolk, from its size and consequence justly styled a city *. It is, however, not mentioned till the year 1004, when it was ruined by the Danes. The worsted manufactory is supposed to have been introduced here by the Flemings, in the 12th century, and was followed by that of sayes arras, bombazeens, &c. Of late the damasks, camlets, crapes, stuffs, &c. here wrought, have been computed at the yearly value of 700,000*l.*; but the fashionable use of cottons, and the interruption of commerce by war, have considerably lessened the consumption. The wool is chiefly from the counties of Lincoln, Leicester, and Northampton; the chief exports to Holland, Germany, and the Mediterranean [23]. Norwich is of course opulent and extensive; but the streets are confined and devious.

Yarmouth.

Yarmouth is a noted sea-port, with a beautiful quay, and remarkable for its fisheries of mackarel in May and June, and herrings in October and November: the latter cured by salt, and dried in the smoke of wood, are called red-herrings, and, besides home consumption, form a considerable article of export to Spain and Italy.

Lincoln.

In proceeding northwards, Lincoln must arrest attention, though now much fallen from its former fame. The interior of the cathedral is admired for its lightness and magnificence. The sheep of the county form a celebrated breed, but the wool goes chiefly to Norwich. Lincoln trades in coals, imported on the Trent.

[22] Gough's Camden, vol. ii. p. 345. [23] Aikin, 216.

* A Bishop's see constitutes a city.

In

In a chorography of England, Leicester and Shrewsbury might deserve description, but its geography can only embrace the most important topics. The city of Chester must claim the next consideration. It is of Roman origin, and the chief streets are singular in their construction, being excavated beneath the level of the ground, while a covered portico, in the front of the houses, affords an elevated and sheltered foot-path; beneath are the shops and warehouses, on the level of the street, to which the passenger descends by occasional stairs. The trade of Chester is not considerable, but it carries on a share of the traffic with North Wales; and its two annual fairs are famous for the sale of Irish linens. It is the favourite residence of many geentel families from Wales [24]. Cities and Towns. Chester.

Near an extensive bay of the Irish Sea, which might now be termed the bay of Lancaster, while antiquaries affect to retain the Roman name of *Moricambe*, stands Lancaster, an ancient and populous town. The name is in the North pronounced Loncaster, the proper etymology, as it stands upon the River Lon. When the counties of Cumberland and Westmoreland belonged to the Scots, this was regarded as a kind of frontier place, and was defended by a strong castle, situated on a commanding eminence. Lancaster afterwards gave the title of Duke to princes of the royal blood; and the contentions of the houses of York and Lancaster are well known. There is a bridge of five arches over the Lon, which opens into a considerable haven; the seat of a moderate commerce, especially with the West Indies. Lancaster.

On the East, the extensive province of Yorkshire contains many flourishing towns, besides the capital, York, and Sheffield, already described. On the Humber, the wide receptacle of many rivers, stands the great sea-port of Hull, or Kingston-upon-Hull; the latter name being only that of the rivulet. The town was founded by Edward I. Several privileges were obtained from Richard II; and the first staple of trade was stock-fish imported from Iceland. In the civil wars of last century, Hull displayed the first flag of defiance against the Monarch. The harbour is artificial, and is supposed to present the largest dock in the kingdom. The trade is important Hull.

[24] Pennant's Tours. Aikin, 90.

Cities and Towns.

with America, and the ſouth of Europe, but chiefly with the Baltic; and ſeveral ſhips are employed in the northern whale-fiſhery. The coaſting traffic is extenſive in coals, corn, wool, and manufactories; and Hull ſupplies the commerce of many northern counties, having not only communication with the Trent, and other branches of the Humber, but with the rivers and canals of Yorkſhire *.

Leeds.

Leeds, Bradfield, Halifax, and Wakefield, are the chief centres of the great manufactures of woollen cloths and ſtuffs. Leeds is the principal mart for broad-cloths, or what foreigners term fine Engliſh cloth. It is ſituated on the river Eyre, in an extenſive vale; and the population is computed at 53,162; being the fifth city on this ſcale: the cloths are woven in the neighbouring villages, but are dyed, prepared, and ſold, at Leeds. The cloth-hall appropriated to the ſale is a vaſt edifice; and the whole buſineſs is tranſacted within the ſpace of an hour on the market days. Halifax is in an elevated ſituation, and very populous. It is the chief market for the thinner woollen cloths, ſuch as ſtuffs, calimancos, &c. Scarborough, on the eaſtern coaſt, is a place of celebrated reſort for ſea-bathing, and the mineral water; the ſite is romantic, but the port is ſmall, and chiefly frequented by fiſhing veſſels.

Durham.

Durham is a pleaſant and venerable city, extending partly over an eminence; the river Were, winding around in the form of a horſe-ſhoe, renders it peninſular. Near the neck of land is placed the caſtle, of which little more than the keep remains; which is ſurrounded by the pleaſant garden of the Biſhop's adjacent palace. Towards the point of the peninſula ſtands the cathedral, a moſt auguſt edifice, in a moſt auguſt ſituation, with deep declivities on the ſouth and weſt, down to the river; the banks of which are finely wooded, and rich in the wild beauties of nature, which have been improved, not injured, by the taſte and opulence of the clergy. The bridge on the eaſt is narrow and meanly executed; but on the ſouth there is an elegant modern bridge; and on the weſt that of Biſhop Flambard is admired for the lightneſs and beauty of the arches. About a mile from the town, on this ſide, ſtands Nevil's Croſs, where

* Aikin, Engl. delin. 56.

David II King of Scotland was taken prisoner after a bloody conflict. The cathedral was built about the year 1004, at least the lower part, which belongs to what is called the Saxon form of architecture; and is now repairing at the expence of the Bishop and Chapter. Some branches of the woollen manufacture are carried on at Durham, and a few elegant carpets have been lately made there in a kind of Mosaic form. Cities and Towns.

Stockton on the river Tees, Sunderland at the mouth of the Were, and South Shields on that of the Tyne, are sea-port towns in the bishopric, (for so the county of Durham is commonly styled in the north,) of considerable size, trade and population. Hart-le-Pool is only a bathing place.

On the river Tyne stands Newcastle, so termed from a fortress erected by Edward I. This is a large and populous town, or rather city, placed in the centre of the grand coal-mines in the counties of Durham and Northumberland, which have for centuries supplied London and most of the east and south of England with that fuel; which has perhaps contributed more to the manufactures and commerce, and consequent wealth and power of this kingdom, than any other material or circumstance. The coal fleets sometimes amount to five hundred sail; their station is at Shields, and the quays of Jarrow and Willington. Even as a nursery of seamen the trade is invaluable [16]. In all parts of the neighbourhood are seen large carts, loaden with coals, and proceeding towards the port, on inclined planes, without the help of horses or men, to the great surprize of the stranger [17]. Near Newcastle are also found quarries of grind-stone; and many glass-houses smoke around, the productions of which have been recently of remarkable purity. Other exports are pickled salmon, lead, salt, butter, and tallow. The suburb of Gateshead stands on the south of the Tyne; and is connected with the city by a grand bridge. The shops and crowded streets recal the idea of London; but the latter are generally narrow, steep, and incommodious. Newcastle.

Berwick-upon-Tweed being on the Scotish side of the river, shall be reserved for the description of that country. The chief remaining Carlisle.

[16] Gough's Camden, iii. 252. [17] St. Fond, Voyage en Angl i. 163.

Cities and Towns.

town in England is Carlisle, the capital of the county of Cumberland, placed at the confluence of the rivers Pettril and Caldew with the Eden [26]. The old fortifications remain nearly entire. It is supposed to have been the ancient Luguballia; but neither the castle nor cathedral are remarkable. The chief manufactures are linens, printed and checked, whips and fish-hooks. The town is little populous; and is chiefly memorable for transactions in the ancient wars between Scotland and England.

Wales, a country abounding in the sublime and beautiful features of nature, contains many towns of note; and the description of a few has been reserved to this place, for the greater clearness of arrangement.

Caermarthen.

Caermarthen, the capital of a county, is also regarded as the principal town in South Wales: it stands upon the river Towy, and was anciently defended by a castle now demolished. The haven is shallow, and the trade of course not very considerable [27].

Pembroke.

Pembroke, on a creek of Milford Haven, is a small town of little commerce.

Caernarvon.

Caernarvon is esteemed the chief town of North Wales, for the beauty of the situation, regularity of the streets, and above all for the grandeur of the castle, one of the most magnificent in Europe, founded by Edward I in 1282. Here was born Edward II surnamed of Caernarvon, who was immediately created the first English Prince of Wales, his father having equivocally promised to the vanquished Welsh a Prince born in their own country, and who could not speak one word of English. The town has a considerable trade with London, Bristol, Liverpool, and Ireland; and has a beautiful quay along the side of the Menai, a streight beteen North Wales and Anglesea [28].

Edifices.

In a brief enumeration of the principal edifices in England, the royal palaces demand of course the first attention. Windsor castle, situated

[26] Gough's Camden, iii. 175. For the rivers, Housman 30.
[27] Gough's Camden, ii. 504. 507. [28] Pennant's Wales, ii. 223. 227.

on

on an eminence, near the Thames, has an appearance truly grand, and worthy of the days of chivalry. The view extends as far as the cathedral of St. Paul's, and the whole ſcene ſtrongly impreſſes the circumſtances ſo vividly delineated in Gray's pathetic ode on Eton College. This palace contains many noble paintings, particularly the cartoons of Raphael. Hampton-court is in a low ſituation, ornamented with aqueducts from the river Colne. This palace is alſo replete with intereſting pictures. The royal gardens alone remain at Richmond, but are totally eclipſed by thoſe of Kew, which are truly worthy of a great and ſcientific prince; the ground, though level, is diverſified with much art, and the collection of plants from all the regions of the known world, fills the admirer of nature with delight and ſurprize. They are ſo diſpoſed, that every plant finds as it were its native ſoil and climate, even thoſe that grow on rocks and lava, having artificial ſubſtitutes. EDIFICES.

The royal palace at Greenwich has been long abandoned, but the obſervatory does credit to ſcience. It is a plain edifice, well adapted to aſtronomical obſervations, and at preſent ably ſuperintended by Dr. Maſkelyne. Dr. Herſchell's obſervatory, inſtead of containing his teleſcope, is ſuſpended from it in the open air, at Slough, near Windſor; where he is continually extending the bounds of aſtronomical knowledge.

Among the houſes of the nobility and gentry, or palaces, as they would be termed on the Continent, the firſt fame, perhaps, belongs to Stowe, the ſeat of the Marquis of Buckinghamſhire, which, for its enchanting gardens, has been long celebrated. When Mr. Beckford's magnificent erections at Fonthill are completed, that fame will be far ſurpaſſed. The preſent intention, however, will be better accompliſhed by a brief view of the edifices, as they occur in the order of counties above arranged.

Cornwall.—Mount-Edgecombe, Lord Edgecombe.
Devonſhire.—Powderham-caſtle.
Wiltſhire.—Wilton, Earl of Pembroke's; Fonthill, Mr. Beckford's; Longleate, Lord Weymouth; Wardour caſtle; Stourton, Mr. Hoare's.
Hampſhire.—The Grange, Mr. Henley; the Vine, Mr. Chute.

Surry.—

EDIFICES.

Surry.—Earl Spencer's at Wimbleton; Farnham castle, Bishop of Winchester; Oatlands, Claremont, Esher; Dulwich, Lord Thurlow,

Sussex.—Arundel castle, Duke of Norfolk; Goodwood, Duke of Richmond; Cowdray.

Kent.—Knowle, Duke of Dorset; Penshurst, near Tunbridge, a famous seat of the Sydneys, &c. &c.

Essex.—Wanstead, Earl of Tilney; Audley-end; Havering, Duke of Ancaster.

Middlesex.—Sion-house, Duke of Northumberland; Osterly-park, Mr. Child; Holland-house, Lord Holland, &c. &c.

Bucks.—Clifdon; Stowe; Bulstrode, Duke of Portland, &c. &c.

Oxfordshire.—Blenheim, Duke of Marlborough; Ditchley, Earl of Litchfield; Newnham, Earl of Harcourt, &c.

Gloucestershire.—Badminton, Duke of Beaufort; Berkley-castle, Earl of Berkley; King's Weston, Lord de Clifford.

Herefordshire.—Aconbury, Duke of Chandos; Brampton Bryan, Earl of Oxford; Clifford-castle, Lord Clifford.

Worcestershire.—Crome-court, Earl of Coventry; Hartlebury, the Bishop; Hagley Lord Lyttleton. The Leasowes of Sheustone is in Shropshire.

Warwickshire.—Tamworth-castle, Earl Ferrers; Warwick-castle.

Northampton.—Althorp, Earl Spencer; Easton, Earl of Pomfret; Burleigh, Earl of Stamford; and Apthorp, Earl of Westmoreland.

Bedfordshire.—Wooburn-abbey, Duke of Bedford; Luton, Marquis of Bute.

Hertfordshire.—Hatfield, Earl of Salisbury; Moore Park, Lord Dundas.

Huntingdonshire.—Kimbolton Castle, Duke of Manchester; Bugden, Bishop of Lincoln.

Cambridgeshire.—Thorney-abbey, Duke of Beaufort; Maddingly, Sir John Cotton; Milton, Mr. Knight.

Suffolk.—Euston-hall, Duke of Grafton; Broome-hall, Lord Cornwallis.

Norfolk.—Houghton, Lord Cholmondley; Raynham, Lord Townshend; Holkham, Earl of Leicester.

Lincoln.—Grimsthorpe, Duke of Ancaster.

Rutlandshire.—Okeham and Burley, Earl of Winchelsea; Ashton, Earl of Cardigan.

Leicestershire.—Belvoir-castle, Duke of Rutland; Croby, Earl of Stamford.

Nottinghamshire.—Nottingham-castle, Duke of Newcastle; Welbeck, Duke of Portland; Worksop, Duke of Norfolk.

Derbyshire.—Chatsworth, Duke of Devonshire; Keddleston, Lord Scarsdale.

Staffordshire.—Beau Desert, Earl of Uxbridge; Dudley-castle, Lord Dudley, &c.

Shropshire.—Okeley-park, Lord Clive; Atcham, Lord Berwick, &c.

Cheshire.—Cholmondley hall, Earl of Cholmondley; Eaton-hall, Earl of Grosvenor.

Lancashire.—Stonyhurst, Duke of Norfolk; Knowsley, Earl of Derby.

Yorkshire.—Sheffield manor, Duke of Norfolk; Wentworth-castle, Earl of Strafford; Wrescl-castle; Castle Howard, Earl of Carlisle; Whalton-castle, Earl of Aylesbury; Hornby-castle, Earl of Holderness; Kiveton, Duke of Leeds, &c. &c.

Westmoreland.—Pendragon-castle, Louther-hall, Lord Lonsdale; Appleby, Earl of Thanet.

Cumberland.—Greystock-castle, Duke of Norfolk; Naworth, Earl of Carlisle.

Durham.—Raby-castle, Earl of Darlington; Bishops Aukland, Bishop of Durham; Lumley-castle, Hilton castle, &c. &c.

Northumberland.—Alnwick, Duke of Northumberland; Morpeth castle, Earl of Carlisle, &c.

Wales

Wales abounds in elegant edifices, as Winſtay, the ſeat of Sir William Watkins Wynne; Lord Bulkley's near Beaumaris; Duke of Beaufort's, in Brecknuckſhire; Chirk caſtle in Denbighſhire; Hawardea-caſtle, in Flintſhire; Swanſey and Cardiff Caſtles, in Glamorganſhire; Powis-caſtle in Montgomery; Picton-caſtle, in Pembrokeſhire *, &c. &c. Edifices.

Among public buildings muſt not be omitted the noble hoſpitals for ſeamen and ſoldiers, at Greenwich, and Chelſea. Many of the county-halls have no inconſiderable claims to elegant architecture.

The bridges are worthy the ſuperiority of the Engliſh roads: and a ſurpriſing exertion in this department, is the recent conſtruction of bridges in caſt-iron, an invention unknown to all other nations. The firſt example was that of Colebrook-dale, in Shropſhire, erected over the Severn, in 1779. This bridge reſts on abutments of ſtone-work, the main rib conſiſting of two pieces, each 70 feet long, connected by a dove-tail joint, faſtened with ſcrews; the ſhorter ribs, croſs-ſtays, braces, &c. &c. would be little intelligible without a delineation. The road over the bridge is made of clay and iron ſlag, 24 feet wide, and one deep; the ſpan of the arch 100 feet 6 inches; height from the baſe line to the centre 40 feet: the weight of iron employed 378 tons 10 hundred weight[y]. Another iron-bridge has ſince been erected in the vicinty. A ſtupendous iron-bridge was thrown over the harbour at Sunderland, about five years ago; the height of which is 100 feet, and the ſpan of the arch 236. The chief defect of the bridge at Colebrook was underſtood to be, that it formed one entire whole, incapable of partial repairs; but that at Sunderland is compoſed of detached pieces of caſt-iron, which if damaged in any of the parts, may be withdrawn, and replaced by others. It is ſupported between two ſtrong and elevated ſtone piers; and the arch is ſurmounted at either end by vaſt hoops, ſupporting the platform, or paſſage of the bridge, which is thus rendered almoſt level. When viewed from beneath, the elegance, Bridges.

* This liſt may perhaps appear to foreigners ſomewhat extraneous in a work of Geography; but they will reflect that it is characteriſtic of the country in which the nobility and gentry paſs a great part of the year in rural life, inſtead of a perpetual reſidence in cities, as in Spain. The late Lord Orford has more than once obſerved to the Author, that if pictures and ſtatues thus diſperſed throughout the country, were collected in a city or two, as in other countries, we ſhould be ſurpriſed at our own opulence.

[y] Gough's Camden, ii. 417.

light-

Bridges.

lightness, and surprising height, excite admiration; and the carriages appear as if passing among the clouds.

Several other bridges have been constructed on this new and singular plan, but not of sufficient importance to demand description, after such great examples. It is said to be in agitation to throw similar fabrics over the Thames, at Staines and Datchet. Many projectors have eagerly contended for the rebuilding of London bridge; if cast-iron were employed, it would be more commodious for navigation, and would impress the beholder with astonishment, at the unrivalled pomp and grandeur of English manufactures.

Inland Navigation.

This article is important to the best interests of the country, and demands particular attention. It is believed that what is called the Caerdyke, extending from the river Nyne, a little below Peterborough, into the river Witham, three miles below Lincoln, was intended for inland navigation: this canal is about forty miles in length, and must have been originally very deep, though now almost filled up [30]. It is supposed to have been a work of the Romans. No trace of further exertion in this department appears, till the year 1608, when the canal or rather aqueduct, called the New River, was projected and begun by Sir Hugh Middleton; it was finished in five years, and winds through a long course from Ware in Hertfordshire, to the grand cistern of Islington. But, in fact, the earliest inland navigation that can be authenticated, is the Sankey canal, leading from the coal-pits at St. Helen's in Lancashire, to the River Mersey, and constructed in order to convey coals to Liverpool [31]. The length of the canal is twelve miles, with a fall of ninety feet. The act of parliament passed in 1755; the original intention was only to render the rivulet called Sankey Brook, navigable; but it was found more advantageous to form a canal along its course. The surveyor was Mr. John Eyes.

But the Duke of Bridgewater is justly venerated as the grand founder of inland navigation: his spirit and opulence were happily seconded by Brindley, than whom a greater natural genius in mechanics never existed. It was in the year 1758 that the first act was obtained for

[30] Philips, Hist. of Inland Navigation, 1795, 4to, p. 72. [31] Ibid. Addenda 29.

INLAND NAVIGATION.

thefe great defigns. The firft canal extends from Worfley mill, about feven computed miles, a circuit of two miles being neceffary for the fake of the level. In this fhort fpace almoft every difficulty occurred that can arife in fimilar fchemes; but mountains and rivers yielded to the genius of Brindley. There are fubterraneous paffages to the coal in the mountain of near a mile in length, fometimes cut through the folid rock, and occafionally arched over with brick; with air-funnels to the top of the hill, fome of them thirty feven yards perpendicular. This beautiful canal is thrown over the river Irwell, by an arch of thirty-nine feet in height, and under which barges pafs without lowering their mafts. Yet the expence of this noble canal, in the then comparatively cheap ftate of labour and provifions, was only computed at 1000 guineas a mile. The various machines and inventions of Brindley, for its conftruction and prefervation, defervedly excite wonder, but a detail cannot be here expected. The duke of Bridgewater foon afterwards extended a canal of twenty-nine miles in length, from Longford bridge, in Lancafhire, to Hempftones in Chefhire.

After this deferved tribute to the fathers of inland navigation in England, it will be eligible to review the other canals in geographical manner, proceeding from the north to the fouth. In the county of Durham, a canal was projected by Brindley, from the romantic village of Winfton, on the river Tees, to Staindrop, and thence by Darlington to Stockton: but this defign, and others not yet carried into execution will be paffed over, and only the moft important of thofe which have been executed fhall be commemorated.

Firft in order is the Lancafter canal, extending from Kendal, in Weftmoreland, by Lancafter, to Weft Houghton, in Lancafhire, a fpace of about feventy-four miles.

The canal from Leeds to Liverpool, directed in a northerly courfe by Skipton, winds through an extent of 117 miles; and from this canal a branch alfo extends to Manchefter, begun in 1771.

From Halifax to Manchefter is another confiderable canal, commonly called that of Rochdale; length thirty-one miles and a half, begun in 1794.

INLAND NAVIGATION.

Another canal extends from Manchester towards Wakefield; and another called the Peak Forest canal, stretches from the former, south-east, about fifteen miles.

Another joins the River Dun, several miles above Doncaster, to the River Calder, near Wakefield.

To pass several of smaller note, the Chesterfield canal extends from Chesterfield, in the county of Derby, to the Trent, at Stockwith, a course of forty-four miles and three quarters, begun in 1770.

In Lincolnshire, one canal extends from Lincoln to the Trent, and another from Horncastle to Sleaford. Grantham canal reaches from that town to the River Trent, a course of thirty miles.

The grand design of Brindley was to join, by inland navigation, the four great ports of the kingdom, Bristol, London, Liverpool, and Hull. Liverpool is accordingly connected with Hull by a canal from that long navigable river the Trent, and proceeding north to the Mersey. The canal which joins these two rivers is styled the Grand Trunk; and was begun in 1766, under the direction of that great engineer; but was not completed till 1777; the length is 99 miles. It was attended with great difficulties, particularly in passing the river Dove, in Derbyshire, where there is an aqueduct of twenty-three arches, the tunnel through the hill of Hare-castle in Staffordshire, is in length 2880 yards, and more than 70 yards below the surface of the ground, and was executed with great labour and expence[12]. But the utility corresponds with the grandeur of the design: salt from Cheshire, coals and pottery from Staffordshire, and manufactures from various places, are transported on this canal.

From the Grand Trunk five or six branches extend in various directions: among which must not be omitted that to the river Severn, near Bewdley, which connects the port of Bristol with those of Liverpool and Hull; the length is 46 miles; completed in 1772.

From the city of Chester one canal extends to the Mersey, and another to Nemptwich; another proceeds south to Shrewsbury, uniting the

[12] Cary's Plans, p. 26, 27, 28. The account of the Grand Trunk in Philips, is very defective, he may here be referred to in general for the others. See also Housman, 122.

Merſey and the Severn; with north-weſt, and ſouth-eaſt branches of conſiderable length. INLAND NAVIGATION.

From Coventry, in the centre of the kingdom, canals extend to the Grand Trunk; to Aſhby-de-la-Zouch, and to the Braunſton, or Grand Junction Canal.

What is called the Staffordſhire canal, extends from the Grand Trunk to the River Severn; and is met by the Kington canal, which reaches to Kington, in Herefordſhire, ſo as almoſt to join the Rivers Trent and Wye. It may be here obſerved, that in this deſcription the grand courſes of navigation are attended to, rather than the minute names and diviſions of the canals.

Several inland navigations paſs by Birmingham. The Union canal completes a courſe of forty-three miles and three quarters, from Leiceſter to Northampton, whence the river Nen is navigable to the ſea.

Another canal extends from Glouceſter to Hereford: and the ſouth of Wales preſents ſeveral navigations of conſiderable length, particularly that from Brecon, in Brecknockſhire, to Newport in Monmouthſhire.

The Severn is not only joined with the Trent and the Humber, by various courſes of navigation, but is united with the Thames, by a canal extending by Stroud to Lechlade, a courſe of near forty miles.

Other canals branch out from the Thames in various directions: that of Oxford extends to the Grand Trunk, or rather joins the Coventry canal, after a courſe of ninety-two miles.

The Braunſton or Grand Junction canal, reaches from Brentford, on the Thames, and joins the Oxford canal at Braunſton, in Northamptonſhire, after a courſe of ninety miles. It is ſtyled the Grand Junction, becauſe it may be ſaid to unite the numerous courſes that pervade the central counties, with the capital of the kingdom.

On the ſouth of the Thames, a canal proceeds from Reading to Bath; and another from Weybridge to Baſingſtoke; and a third from Weybridge to Godalming.

INLAND NAVIGATION.

A ſmall canal or two have been executed in Devonſhire. The Andover canal, in Hampſhire, extends from Andover to Southampton water. Suſſex preſents two canals, that of Arundel, and that of Lewes.

When we reflect that all theſe laudable efforts of improvement and civilization, have been executed within theſe forty years, there is room for well-grounded hopes, that in the courſe of centuries the kingdom may be interſected, like another China, with innumerable canals, to the inconceivable advancement of agriculture, commerce, and the national induſtry and proſperity. The ſum already expended in theſe noble works, has been computed at five millions and a half; but how much more uſefully employed, than in fruitleſs wars, which conſume fifty millions in one year!

Manufactures and Commerce.

The Manufactures and commerce of England, form ſo extenſive a theme, that only a brief and fugitive idea of them, can be here attempted. The earlieſt ſtaple commodity of England was tin, a metal rarely found in other countries. The Phœnicians firſt introduced it into commerce, at leaſt five or ſix hundred years before the Chriſtian æra; and their extenſive trade ſoon diffuſed it among the Oriental nations. The Romans, upon their conqueſt of theſe regions, did not neglect this ſource of wealth; but as Cornwall was not conquered by the Anglo-Saxons till the reign of Athelſtan, we know not whether the Corniſh Britons carried on any conſiderable traffic in this commodity, though it be probable that it was at leaſt exchanged for the wines of France. Yet even in the reign of John, the product was ſo inconſiderable, that the mines were farmed to Jews for 100 marks; but in that of Henry III., they began again to yield a large profit, which has gradually increaſed[n].

Cornwall, like moſt countries that abound with minerals, preſents an external aſpect of deſolation: a ſeries of barren hills, and bleak heaths, pervades its whole length; and the violent winds from the ſea check the vegetation of trees and ſhrubs. The tin mines are numerous, and

[n] Borlaſe's Cornwall.

of various deſcriptions. This metal is either found in the maſs, in what are called *lodes* and *ſtools*; or in grains, or bunches, in the rocks; or detached in ſeparate ſtones, called *ſhodes* or *ſtrings*; or in a courſe of ſuch ſtones called the *beubeyl* or *living ſtring*; or in the pulverized ſhape of ſand. After having been pounded in a mill, it is melted into blocks of 320 pounds weight. In the ore it is ſtyled black tin; but is ſometimes, though very rarely, found in a metallic ſtate. MANUFACTURES AND COMMERCE.

The ſingularity and importance of this firſt national ſtaple, may apologize for this diſcuſſion; but the abundance of the other topics will require more brevity. Wool had been regarded as a grand ſtaple of England, as early as the twelfth century, but was chiefly exported in a crude ſtate, till Edward III. encouraged ſettlements of Flemiſh manufacturers. Wool ſoon became the ſtandard of private property, and the prime article of commerce. Taxes and foreign ſubſidies were eſtimated by ſacks of this commodity *. Great quantities of raw wool continued to be exported to the Netherlands and Hanſe Towns; but in the reign of Elizabeth it began to be chiefly manufactured at home, and the exportation of woollen cloths was then valued at a million and a half annually. The exportation of raw wool was at length prohibited; and the woollen manufactures preſerve great importance, though they no longer attract ſuch particular regard, amidſt the exuberance of Engliſh manufactures.

In recent times, the manufactures of iron and copper, native minerals, have become great ſources of national wealth; nor muſt the new and extenſive exportation of elegant earthen-ware be forgotten. The cotton manufacture is diffuſed far and wide, forming a grand ſource of induſtry and proſperity. That of linen is not much cultivated in England, though nature would rather demand that flax ſhould be cultivated in this fertile country, while ſheep and wool were reſtricted to the hilly paſtures of Scotland. The manufactures of glaſs and fine ſteel,

* Campbell's Political Survey, vol. ii. p. 151, 152. A work opulent in materials, but of moſt tedious and uncouth execution.

clocks,

MANUFACTURES AND COMMERCE.

clocks, watches, &c. are deſervedly eminent and extenſive. As the nation is indebted to Wedgewood for converting clay into gold, ſo to Boydell for another elegant branch of exportation, that of beautiful prints.

Beſides manufactured articles, England exports a number of native products too numerous to be here mentioned.

The Engliſh manufactures have been recently eſtimated at the annual value of 63,600,000*l.* and ſuppoſed to employ 1,585,000 perſons[31]. Of theſe the woollen manufacture is ſuppoſed to yield in round ſums, 15,000,000*l.* the leather 10,000,000*l.* the iron, tin, and lead 10,000,000*l.* the cotton 9,000,000*l.* The other chief manufactures, which yield from 1 to 4,000,000*l.* may be thus arranged, according to their conſequence, ſteel, plating, &c. copper and braſs, ſilk, potteries, linen and flax, hemp, glaſs, paper.

The Commerce of England is, at the preſent period, enormous, and may be ſaid to extend to every region of the globe. It was conceived that the defection of the American colonies, would have proved detrimental in this view; but the commercial conſequences have been little important. The trade with the Weſt Indies furniſhes another grand reſource: and that with the Eaſt Indies alone, would have aſtoniſhed any of the celebrated trading cities of antiquity. The following table will preſent a more complete view of the ſubject, than could otherwiſe be conveyed. It relates ſolely to the port of London for one year, ending 5th of January, 1795, ſince which the commerce has increaſed.

Names of the Countries.	Value of Imports into London.			Value of Exports from the Port of London, to Foreign Parts. Britiſh Manufactures.			Foreign Merchandize.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
Ireland - -	2,209,501	3	4	168,687	18	3	914,352	4	4
Britiſh Weſt Indies -	6,072,117	5	0	2,249,043	13	11	579,453	6	0
Conquered Iſlands -	1,226,064	13	8	260,976	0	11	110,817	18	0
Britiſh American Colonies	307,412	13	0	654,842	19	3	251,551	6	2
Guernſey and Jerſey -	91,936	1	2	12,001	13	10	21,616	16	8
Carried forward	9,907,031	16	2	3,345,552	6	2	1,877,791	11	2

[31] Mr. Grellier, in the Monthly Mag. January 1801.

Gibraltar

Names of the Countries.	Value of Inports into London.			Value of Exports from the Port of London, to Foreign Parts. British Manufactures.			Foreign Merchandize.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
Brought forward	9,907,031	16	2	3,345,552	6	2	1,877,791	11	2
Gibraltar - -	12,947	16	8	83,473	14	11	69,315	2	8
Honduras Bay -	14,696	4	2	2,029	18	11	2,550	16	2
South Fishery - -	197,680	8	6	21	6	8	—	—	—
Asia, including East Indies	8,916,950	2	10	3,398,680	1	4	185,190	16	6
Africa - -	66,013	8	4	90,593	12	9	188,743	16	0
Turkey - -	641,860	19	2	32,065	12	0	123,776	7	2
Streights - -	8,399	14	0	—	—	—	--	--	
Venice - -	82,107	16	0	6,203	17	11	16,305	7	2
Italy - -	1,215,012	15	0	80,980	18	9	340,786	0	8
Spain - -	1,070,697	18	0	205,096	4	4	265,169	3	4
Portugal - -	644,610	3	8	182,780	6	2	119,813	12	6
Madeira - -	7,479	16	8	27,998	6	10	6,886	18	2
Canaries - -	6,763	19	10	20,116	18	4	377	5	2
France - -	130	6	8	3,216	5	3	63,625	10	6
Austrian Flanders -	137,249	5	0	129,413	9	7	887,642	18	10
Holland -	1,203,515	3	6	114,458	3	7	1,968,687	3	4
Germany -	1,089,307	19	4	1,044,634	18	0	6,176,100	14	8
Prussia - -	196,657	3	2	54,380	14	0	272,719	17	4
Poland - -	104,978	10	4	7,022	11	10	57,067	2	4
Sweden - -	262,727	3	4	33,845	5	6	111,457	14	4
Russia - -	1,269,688	9	6	95,519	8	8	491,244	9	2
Denmark and Norway	166,366	1	0	147,340	5	11	545,509	19	8
Greenland - -	26,753	11	2	—	—	—	—	—	—
United Sates of America	811,511	18	8	2,251,280	12	1	429,248	7	8
Florida - -	16,239	16	0	38,067	0	3	8,855	0	0
Foreign West Indies	56,240	2	0	1,767	13	10	60	0	0
Prize Goods -	1,572,868	8	8				Included in the account of each country.		
	29,706,476	17	4	11,396,539	13	8	14,208,925	14	6

RECAPITULATION.

The aggregate value of goods imported into London in one year					29,706,476	17	4
British Manufactures exported	£. 11,396,539	13	8				
Foreign Merchandize, do.	14,208,925	14	6				
					25,605,465	8	2
Value of goods imported in upwards of 9000 coasting vessels, averaged at 500*l.* each.	4,500,000	0	0				
Value of goods exported coastways in about 7000 vessels, at 1000*l.* each.	7,000,000	0	0				
					11,500,000	0	0
Total amount of property shipped and unshipped in the River Thames, in the course of the year, estimated at - - -					66,811,942	5	6

If

COMMERCE. If to this eſtimate be added thoſe of the ports of Liverpool, Briſtol, &c. how enormous muſt be the amount[34].

From the States of North America, are chiefly imported tobacco, rice, indigo, timber, hemp, flax, iron, pitch, tar, and lumber. From the Weſt Indies, ſugar, rum, cotton, coffee, ginger, pepper, guaiacum, ſarſaparilla, manchineal, mahogany, gums, &c. From Africa, gold duſt, ivory, gums, &c. From the Eaſt Indies and China, tea, rice, ſpices, drugs, colours, ſilk, cotton, ſalt-petre, ſhawls, and other products of the loom. From our remaining ſettlements in North America, are imported furs, timber, pot-aſh, iron; and from the various States of Europe, numerous articles of utility, and luxury.

On introducing the Income Tax, Mr. Pitt gave the following eſtimate of the annual income of Great-Britain[35].

The land rental, after deducting one-fifth	£. 20,000,000
The tennant's rental of land, deducting two-thirds of the rack-rent	6,000,000
The amount of tythes, deducting one fifth	4,000,000
The produce of mines, canal navigation, &c. deducting one fifth	3,000,000
The rental of houſes, deducting one fifth	5,000,000
The profits of profeſſions	2,000,000
The rental of Scotland, taking it at one eighth of that of England	5,000,000
The income of perſons reſident in Great Britain, drawn from poſſeſſions beyond the ſeas	5,000,000
The amount of annuities from the public funds, after deducting one-fifth for exemptions and modifications	12,000,000
The profits on the capital employed in our foreign commerce	12,000,000
The profits employed on the capital in domeſtic trade, and the profits of ſkill and induſtry	28,000,000
In all	£. 102,000,000

By others, the landed property of Great-Britain has been computed at the rental of 33,000,000*l.* which, at thirty years purchaſe, would yield 990,000,000*l.*; the rental of houſes in England and Wales[36], at 7,436,000*l.* and eſtimating that of Scotland at about a ſixth, the value at fifteen years purchaſe, might be about 130,000,000*l.* The cattle and farming-ſtock, about 100,000,000*l.* the furniture, apparel, &c. 26,000,000*l.* The navy and merchant-ſhips have been valued at 16,000,000*l.*; the goods in the hands of merchants and

[34] Colquhoun (or Cohoun) on the Police.
[35] New Annual Regiſter, for 1799, p. 114.
[36] Grellier, Month. Mag. Sept. 1800.

wholeſale

wholesale dealers, more than 13,000,000*l.* and those in the hands of manufacturers and retail traders, more than 22,000,000*l.* Including the money, of which the estimate is far from certain, the whole capital of Great-Britain may be calculated at more than one thousand two hundred millions *. COMMERCE.

In the year 1797, the amount of the exports, according to Custom-house accounts, was 28,917,000*l.* and of the imports, 21,013,000*l.* † yielding, as is supposed, clear profits on foreign trade, to the amount of at least 10,000,000*l.* The number of merchant vessels is supposed to amount to 16,000; and it is supposed that 140,000 men and boys are employed in the navigation.

* In the beginning of the eighteenth century, Gregory King supposed the value of England and Wales to be 650,000,000*l.* MS. Harl. No. 1,898. The national debt now approaches 500,000,000*l.*

† Mr. Pitt in 1799, computed the imports at 25, and the exports at more than 33,000,000*l.* In Feb. 1801, the Foreign exports at 17, the domestic 20,000,000*l.* in all, 37,000,000*l.*

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of Great-Britain is perhaps more variable than that of any other country on the globe, as the vapours of the Atlantic Ocean, are opposed to the drying winds from the Eastern Continent. The western coasts in particular, are subject to frequent rains; and the eastern part of Scotland is of a clearer and dryer temperature than that of England. The humidity of the climate, indeed, clothes the delicious vales and meadows with a verdure unknown to any other region; but is injurious to the health of the inhabitants, by causing colds and catarrhs, the frequent sources of more deadly disorders, particularly of consumptions, which are fatal to many in the prime of youth. The moist and foggy climate conspires with the great use of gross animal food, to produce that melancholy, which is esteemed by foreigners a national characteristic. As trees particularly attract the moisture of the atmosphere; it may be questioned whether the noted abundance of them in England, contribute to the general salubrity.

In consequence of the mutability of the climate, the seasons themselves are of uncertain tenour. Aged people have always been given to magnify the advantages of their youth, but many observers, endowed with philosophical skill, and candid judgment, have agreed, that since the year 1775, a considerable change has taken place in the temperature of the year, both in Great Britain and Ireland [1]. The winters in general have been more moist and mild, and the summers more humid and more cold, than will be found on an average of preceding

[1] See Memoirs of the Irish Academy, vol. ii.

years.

years. The year might more properly be divided into eight months of winter, and four of ſummer; than into any theoretic arrangement, originating in the ſouthern latitudes. What is called the Spring, dawns in April, commonly, indeed, a mild month; but the eaſtern winds prevalent in May, ſeem commiſſioned to ruin the efforts of reviving nature, and deſtroy the promiſe of the year. June, July, Auguſt and September, are uſually warm ſummer months; but a night of froſt is not unknown, even in Auguſt, and ſometimes a cold Eaſt wind will blow for three days together; nor of late years are ſummers unknown of almoſt conſtant rain*. What the gardeners call *blight*, ſeems alſo more common in England than in any other region; and whatever be the cauſe, is frequently very deſtructive, eſpecially to the hop-plants and the fruit trees. The winter may be ſaid to commence with the beginning of October, at which time domeſtic fires become neceſſary; but there is ſeldom any ſevere froſt till Chriſtmas, and January is the moſt ſtern month of the year. Yet as our ſummers often produce ſpecimens of winter, ſo now and then gleams of warm ſunſhine illuminate the darker months, though rarely amounting to what the French call *un eté de St. Martin*, or Martinmas ſummer. March is generally the moſt unſettled month of the year, interſperſed with dry froſt, cold rains, and ſtrong winds, with ſtorms of hail and ſleet. Climate and Seasons.

A chief ſtep to the ſtudy of Geography, conſiſts in the knowledge of what may be termed the phyſiognomy of the country, yet has no province in this ſcience been ſo completely neglected. We have even maps of Scotland and Switzerland, without mountains, and maps of China without canals. The chief features of any country are its hills, vales, and rivers; and of a maritime ſtate, the ſea-coaſt. Mr. Pennant, in his Arctic Zoology, has given an admirable deſcription of part of the Engliſh ſhores, which ſhall here be abbreviated, with an alteration in the arrangement, as he chooſes to begin with the Streights of Dover. Face of the Country.

From the mouth of the Tweed to Bamborough, extends a ſandy ſhore; and the moſt remarkable object is Lindesfarn, or Holy Iſland, divided from Northumberland by a level, which is dry at low water,

* The ſummer of 1800 was remarkable for dryneſs and warmth, ſcarcely any rain falling from the 6th of June to the 20th of Auguſt, when a thunder ſtorm ſucceeded.

Face of the Country.

but out of which the flowing tide oozes ſuddenly, to the terror and peril of the unwary traveller. From Bamborough Caſtle, to Flamborough-head, are moſtly low cliffs, of lime-ſtone, and other materials; and at Sunderland of a peculiar ſtone uſed in building, and which ſeems the work of marine inſects. Scarborough ſtands on a vaſt rock, projecting into the waves; but Flamborough-head is a far more magnificent object, being formed of lime-ſtone, of a ſnowy whiteneſs, and ſtupendous height, viſible far off at ſea. Grand caverns open on the north ſide, "giving wide and ſolemn admiſſion, through moſt exalted "arches, into the body of the mountain; together with the gradual "decline of light; the deep ſilence of the place, unleſs interrupted by "the ſtriking of the oar, the colliſion of a ſwelling wave againſt the ſides, "or the loud flutter of the pigeons, affrighted from their neſts in the "diſtant roof, afford pleaſures of ſcenery, which ſuch formations as "this alone can yield. Theſe alſo are wonderfully diverſified. In "ſome parts the caverns penetrate far, and end in darkneſs; in others "are pervious, and give a romantic paſſage by another opening, equally "ſuperb. Many of the rocks are inſulated, of a pyramidal form, and "ſoar to a great height. The baſes of moſt are ſolid, but in ſome "pierced through and arched. All are covered with the dung of the "innumerable flocks of migratory birds, which reſort here annually "to breed, and fill every little projection, every hole, which will give "them leave to reſt[s]."

Hence to the Humber are commonly clay cliffs; and near Spurn-head amber is ſometimes found. The extenſive coaſt of Lincolnſhire is flat, and, according to Mr. Pennant's opinion, has been gained from the ſea; though, in ſome parts, the ſea has in its turn invaded the land, and the remains of a foreſt are viſible under the waves. The county of Lincoln, and part of ſix others, are the low countries of Britain; and the coaſt is diſtinguiſhable by churches, not by hills. The ſhores of Norfolk and Suffolk preſent ſometimes loamy or clayey precipices, ſometimes hillocks of ſand, and ſometimes low and flat ſpaces. Hunſtanton-cliff riſes to the height of about eighty feet, compoſed of chalk

[s] Pennant's Arctic Zoology, vol. i. p. xv.

and friable ſtone, reſting on a baſe of what is called iron-coloured pudding-ſtone *, projecting into the ſea. The coaſt of Eſſex is generally low; but to the ſouth of the Thames, ariſe continued cliffs of chalk, with layers of flint, reſembling maſonry. The North Foreland is a loſty chalky promontory; and the Cliffs of Dover are known to every reader of Shakeſpeare. FACE OF THE COUNTRY.

It is to be regretted that Mr. Pennant did not extend his animated deſcription to the ſouthern and weſtern coaſts: cliffs of chalk and clay are interſperſed with flat gravel, till the iſland of Portland preſents its bold rocky front. The weſtern ſhores abound with granite, and other ſiliceous rocks, ſlate, and lime-ſtone.

The ſoil and agriculture of England, are topics which have recently been illuſtrated in ſuch a multiplicity of meritorious works, that the ſubject labours under the abundance of the materials. A few very general remarks muſt here ſuffice. The ſoil is greatly diverſified, but in general fertile; and in no country is agriculture more thoroughly underſtood, or purſued in a grander ſtyle, except, perhaps, in Flanders and Lombardy. The nobility and gentry, moſtly reſiding upon their eſtates in ſummer, often retain conſiderable farms in their own hands, and practice and encourage every agricultural improvement. The writings of Mr. Young, the inſtitutions in the weſt, and the Board of Agriculture, recently erected, have contributed to diffuſe a wide and laſting knowledge of this intereſting branch. The intermixture of the green crops with thoſe of grain, the uſe of turnips, the irrigation of meadows, the regular ſubſtitution of crops appropriated to the ſtate of the land, the art of draining conducted on ſcientific principles, may be mentioned among the recent advances of knowledge; nor muſt the improvements in the breed of ſheep and cattle, introduced by Bakewell and others, be forgotten. Soil and Agriculture.

Amidſt ſuch topics of juſt exultation, it is mortifying to reflect upon two circumſtances, the deficiency of a proper ſupply of grain, and the immenſe extent of the waſte lands in this induſtrious country. The cultivated acres in England and Wales are computed at upwards of 39,000,000, while thoſe uncultivated are 7,888,777. Of theſe it is

* The *farcilite* of Kirwan from the Latin: better from the Greek, *baliſite*.

ſuppoſed

Soil and Agriculture.

ſuppoſed that not above half a million is wholly unimprovable, and perhaps a million is only fit for plantations, while of the remainder one quarter is fit for tillage, and three fourths for meadow and upland paſture[3]. Mr. Middleton[4] computes the arable land in South Britain at only 14,000,000 of acres, upon a general view of the conſumption of the country, as we import corn proportionate to the produce of 378,000 acres. He ſuppoſes the ſtate of crops on each 10,000,000 of acres to be as follows:

Wheat	2,750,000 Acres.
Oats and beans	2,500,000
Barley and Rye	750,000
Roots	1,000,000
Clover	1,000,000
Fallow	2,000,000
Total	10,000,000

The utility of fallow is a dubious topic; and the million in clover may be arranged as paſturage which otherwiſe occupies not leſs than 21,000,000 of acres, while 2,000,000 are aſſigned to woods, copſes, and hedge-rows[5]; and more than 1,500,000 are unavoidably conſumed in roads, rivers, and waters, &c. The ſubject can only be well diſcuſſed by the moſt competent judges; but it may be curſorily obſerved, that as the radical error of French agriculture, was an exceſs of land under grain, whence there was a deficiency of paſture, of cattle, and consequently of manure, ſo that the arable ground was ſtarved; ſo in England there may, perhaps, be an exceſs of paſturage. Whatever be the cauſes a growing population, certainly increaſing luxury and waſte, the neglect of the waſte lands, or other ſources, the conſumption of grain in this country, has, it is believed, ſince the middle of the laſt century, particularly ſince 1767, generally exceeded the produce; and the evil has gradually increaſed to an alarming extent. On an average of eleven years, cloſing with 1793, the annual deficiency amounted to 587,163 quarters of grain[6]; nay, in 1795, the ſcarcity demanded a ſtill further ſupply of 1,177,000 quarters; which alſo, divided by 11, will

[3] First Report of the Committee of the Houſe of Commons, p. 22.
[4] View of Middleſex, p. 484. [5] Ib. 486. [6] Ib. 481.

produce

produce the whole annual defect of 694,163 quarters. Computing produce at three quarters an acre, the land required, exclusive of the seed, would be 231,388 acres cropped with corn; while about half as much must be added for fallow and the rotation of crops. For an abundant supply 500,000 of acres might be requisite, which might seemingly be assumed with little difficulty from at least 1,500,000 waste acres in south Britain, which are fit for tillage. Yet this calculation would infer that the deficiency does not exceed the twenty-eighth part of the whole, which seems too small, as the bread has been doubled in price; and, indeed, these theoretic views can never pretend to much exactness. If South Britain annually produce 11,500,000 quarters of wheat, the deficiency can hardly be supposed less than a tenth part. Scarcity, indeed, multiplies the consumption, as the poor are reduced to the use of bread only; but still the rise in the price of that article, appears to exceed any fair calculation.

Horticulture, or the art of gardening, is also pursued in England with great assiduity and success. The large supply of the capital in vegetables and fruits, and the high prices given for early produce, occasion such a spirit of cultivation, that each acre thus employed, is supposed to yield about 120*l.* annually, the consumption in the metropolis being computed at more than 1,000,000*l.* annually. While Mr. Middleton computes the hop-grounds in South Britain at 44,000 acres, he allows 10,000 for nursery grounds, 50,000 for fruit and kitchen gardens, and 20,000 for pleasure-grounds, that is the unprofitable parts of the latter, the rest being pastured for cattle, or mown for hay. Of ornamental gardens, laid out with a just attention to the beauties of nature, and free from the uncouth affectations of art, England is deservedly regarded as the parent country[7]. The first idea has been referred to Milton's description of Eden; and a paper in the Guardian is supposed to have induced Bridgman, a fashionable designer of gardens, to begin this reform, which was successfully followed by Kent, while the Duke of Argyle introduced the various foliage of exotic trees. One of Kent's best works was the garden at Rousham, while Claremont, Esher, and other places, also proclaim the extent of his powers. The

[7] Lord Orford on Modern Gardening.

Soil and Agriculture.

new designs were seconded by several gentlemen of taste; and Kent was followed by Brown, who has been succeeded by Repton, and other masters of great abilities. In the course of little more than half a century, this taste has not only been diffused in Great Britain, but has been imitated in several favourite spots on the Continent, even as far as the rude climate of Russia.

Rivers.

But the rivers and mountains of a country constitute its most important features; and without just delineations of them, the geographical portrait cannot boast much truth or resemblance. England is intersected by four important rivers, the Severn, the Thames, the Humber, and the Mersey. The Severn rises from the mountain Plenlimmon, and after an easterly course to Shrewsbury, bends its progress almost south to Gloucester, whence it flows south-west into the Bristol Channel, a progress of about 150 miles, navigable as far as Welch-pool. Its chief tributary streams are the Northern and Southern Avons, the Teme and the Wye [8].

Severn.

Thames.

The Thames originates in Cotswold-hills, Gloucestershire; and maintains a south-easterly direction, to its egress into the German Ocean, after receiving the Cherwel, the Teme, the Kennett, another Wye, the Mole, and Lee. The Medway flows into the estuary of the Thames, as the Wye into that of the Severn. The course is computed at 140 miles, navigable to Cricklade [9].

Humber.

The Humber is a name almost confined to a large estuary, which receives many considerable rivers that fertilize the central parts of England. Of these the Trent is the most important, which rises at New-pool, in Staffordshire, and proceeding North-east, enters the Humber, after a direct course of about 100 miles, being navigable to Burton in Staffordshire. The other principal rivers that issue into the Humber, are the Dun, a navigable stream which runs by Doncaster; the Aire navigable to Leeds, and the Calder navigable to Halifax, both singularly useful in transporting the woollen manufactures; the Warf, navigable to Tadcaster; and the noble river Ure, or Ouse, which runs by York, and forms another grand branch of the

[8] Campbell, I. 146. [9] Ibid. I. 139.

Humber,

Humber, navigable to Rippon: nor muſt the Derwent be omitted, which is navigable to New Malton; nor, though laſt and leaſt, the Hull. The Humber may be regarded as the ſtem of a venerable oak, which, as uſual with that tree, ſpreads its chief branches in a horizontal direction. RIVERS.

Though the Merſey preſent a grand eſtuary, its courſe is not of great extent. It ariſes in the Weſt Riding of Yorkſhire, and runs to the ſouth-weſt; but the eſtuary bends towards the north. The direct courſe is not above 50 miles; and is navigable to Stockport: as the Irwell to near Mancheſter, and the Weever to near Northwich, and the mines of rock-ſalt. Merſey.

In briefly deſcribing the other navigable rivers of this kingdom, it may be proper to return to the Severn, and proceeding ſouth-weſt, purſue the outline of the coaſt. The Avon is navigable to Bath, the Perrot to Ilcheſter, the Tone to Taunton, the Taw to Barnſtaple, and another branch to Biddeford; the Camil of Cornwall, to Wedbridge, while the Plym, Dart, and Ex, can alſo be pervaded to a conſiderable height. Another Avon is navigable to near Saliſbury, the Itchyn to Wincheſter, the Arun to Arundel, the Ouſe to Lewes: the Rother, which forms the haven of Rye, is yet navigable, though fallen in fame. The Stour admits boats even to Canterbury; but the Medway preſents a navigable ſtream as far as Tunbridge. On the North of the Thames, the Lee is navigable to Biſhop's Stortford and Hertford: the Crouch conveys boats from the ſea to Hull-bridge in Eſſex; the Black-water to Chelmsford, and another branch to Colcheſter. The Stour is navigable to Sudbury; the Orwell to Stow, the Deben to Woodbridge: the Yare and Waveney preſent acceſs to Foulſham and Bungay. Next is the eſtuary called the Waſh, which receives the Ouſe, the Nen, the Welland, the Witham, all ſtreams of conſiderable navigation.

On the North of the Humber, the Tees admits veſſels to Stockton; the Tyne to Newcaſtle. On the Weſt, the Eden is navigable to Carliſle; the Lon to Lancaſter and Hornby; the Dee to Cheſter; the Conway to within two miles of Llanrwſt; the Tivey to Llanpiter. Milford Haven preſents branches navigable to Haverford-weſt, and to

Rivers. near Wiſton: and laſtly, the Wye may be purſued as far as Hay, in Brecknockſhire.

In general it may be obſerved of the Britiſh rivers, that the length of their courſe is inconſiderable, when compared with that of the Continental ſtreams. The length of the Thames compared with that of the Danube, is only as 1 to 7, and with that of the Nile, as 1 to 12. The Kian Ku of China, and the river of Amazons in South America, extend through a progreſs of more than fifteen times the length of that of the Thames. The rivers of the Southern and middle parts of England, preſent a ſtriking contraſt to thoſe of the North; the former purſuing a ſlow and inert courſe over mud, between level banks, amid rich and extenſive meadows; while the latter roll their clear torrents over beds of gravel, between elevated banks, and rocky precipices; and even when verdant levels occur, the ſtream ſtill retains its banks and beds of gravel.

Mountains. The mountains form another grand feature of geography. They ſeldom appear ſingle, but are either diſpoſed in lines or ridges, called chains, or in anomalous cluſters. When they can be arranged under the firſt form or denomination, as the Alps for example, or the Pyrenees, they afford great clearneſs to geographical limits and deſcriptions. It is not, however, to be conceived, that a chain of mountains forms one ſeries, as delineated in ſmall maps, for the leading ſummits diverge on both ſides into extenſive ribs, gradually melting into the champaign country. And the cluſters, if accurately ſurveyed, will generally be found to preſent central elevations, whence ſmaller branches irradiate.

While Bennevis, the higheſt mountain in Scotland, is not much above one quarter of the height of Mont Blanc, the ſovereign of the Alps, the Engliſh and Welſh ſummits aſpire to heights ſtill leſs conſiderable; Snowden being only 3568 Engliſh feet above the ſea, while Bennevis is 4387, or by other accounts, 4350. But Wharn, or Wharnſide, in Yorkſhire, was eſtimated at 4050 *.

Even

* In the map of the Weſt Riding, in Cary's Engliſh Atlas, Wharn is ſaid to be 1780 yards, or 5340 feet; while Ingleborough is 1760 yards, or 5280 feet; and Pennigant 1740 yards, or 5220 feet. This meaſurement is from the map of Yorkſhire, by Jeffries.

Mr.

Even at the prefent day, the geography of fome parts of New Holland, is better underftood than that of fome parts of Great Britain. There is not even a feparate map of the Englifh rivers, though France fet an example of this kind, a century and a half ago; nor has there

MOUNTAINS.

Mr. Houfman, in his Defcription of Cumberland, &c. (Carlifle, 1800, 8vo.) is the moft recent authority for the height of the Britifh mountains, which he exhibits in the following table;

"*Heights of the Mountains above the Level of the Sea.*	Feet.
Snowden, in Wales, by Waddington	3456
Whernfide Do.	4050
Pendle hill Do.	3411
Pennygent Do.	3930
Ingleborough, Do.	3987
Helwellyn, by Donald	3324
Skiddaw, Do.	3270
Crofs fell, Do.	3390
Saddleback, Do.	3048
Benlomond	3240
Benevifh	4350
Ben-y-bourd higher } By Pennant.	
Laghin-y gair } Perpetual fnow.	
Benwewifh, } Perpetual fnow.	
Skiddaw, by the experiments of Mr. Walker, from the plane of the fea, at Whitehaven	3530
Crofs fell, by Pennant	3839"

But great fkill and precifion are required in meafuring the heights of mountains. A late excellent mathematician, Mr. Ewart, of Lancafter, meafured the height of Ingleborough, with felect and high-priced inftruments, and great care. Here is the refult, as communicated to me by Dr. Garnett;

Height of Ingleborough above the level of the Sea, in feet and decimals.	
By barometrical admeafurement	2377.12
By trigonometrical	2380.7
Difference only	3.67

Wharn cannot be above 100 feet higher, while Pendle and Pennigant are lower. The meafurements by Donald are probably near the truth; Crofsfell being, in Dr. Garnett's opinion, the higheft mountain in England.

Mr. Houfman has, however, given a good general View of the Englifh mountains. On coming from the fouth (p. 5.) they begin in Derbyfhire, ftretching a little into Chefhire. The tops of the ridges are commonly wet and boggy, and produce heath, bent-grafs, and rufhes. They are almoft univerfally calcareous. Near Penrith (p. 8.) they almoft wholly difappear. The fummit of Crofsfell (p. 18.) is fcarcely 1000 yards above the fea, and prefents a large heap of loofe whitifh free-ftone, or, more probably, argillaceous grit.

Mountains. been any attempt to delineate the chains of mountains in England. The imperfection of the materials muſt therefore apologize for any errors or defects in the ſubſequent ſlight ſketch. The mountains of Cheviot may be ſaid to form a regular ridge, running from the ſouth-weſt, where they join thoſe of Galloway to the north-eaſt. But there is a central ridge which pervades England from north to ſouth, beginning at Geltſdale foreſt, 14 miles S. E. of Carliſle *, and paſſing on the weſt of Durham and Yorkſhire, where it contains mines of coal and lead, but is ſplit into inſignificant appellations of *fells* and *laws*. Kelton-fell, Stanmore, Widehill-fell, Wildboar-fell, Bow-fell, Home-fell, Bun-hill, &c. &c. ariſe on the weſtern limits of Yorkſhire. Cumberland and Weſtmoreland preſent many detached mountains, Skiddaw, &c. which can hardly be reduced to any diſtinct arrangement; but thoſe of Craven, in the Weſt Riding of Yorkſhire, as Wharn, or as commonly called by the country people, Wharnſide, Ingleborough, and Pennigant; and Pendle on the eaſt of Lancaſter †; belong to the Central Chain, which proceeds ſouth, through Derbyſhire, ſtill abounding with minerals and natural curioſities; but here it ſeems to terminate, ſpreading a little into Cheſhire. Still, however, a central chain of ſmaller elevation, may be traced, in a zig-zag line, to near Saliſbury, with two diverging and irregular branches on the eaſt, one towards Norfolk, another into Kent, while a third runs ſouth-weſt into Cornwal. To the firſt belong the hills of Gogmagog, in Cambridgeſhire, &c. to the ſecond the hills of Hampſhire, Surrey and Kent. Malvern hills, in Worceſterſhire, deviate from the central ridge, while thoſe of Cotſwold, in Glouceſterſhire may be regarded as a continuation of it. The hills of Mendip, Polden, Sedgemoor, Blackdown, in Somerſetſhire; the Tores and Wilds of Dartmore, in Devon; and the hills and upland downs of

Cheviot.

Central Chain.

* The heathy tract extends to Bewcaſtle and Nichol Foreſt, but is level. Houſm. 427.

† That Ingleborow-hill, Pendle, and Pennigent,
Should named be the higheſt betwixt our Tweed and Trent.
Drayton's Poly-Olbion, Song 28.

It is remarkable that Wharn, the higheſt, is omitted.

Cornwal,

Cornwal, extend this chain to the Land's End: and after paſſing this laſt rocky province, it expires in the Iſlands of Scilly *. MOUNTAINS.

Wales is a country abundant in mountains, eſpecially the northern provinces; but their orology remains indeterminate, and it would require the actual ſurvey of an experienced engineer, to reduce them to chains and groupes. To begin with the North, Snowdon commands the firſt attention, a mountain of eminent height and fame. The top is called Y Widdfa, or the conſpicuous, forming almoſt a point, and preſenting a view of the county of Cheſter, the mountains of Yorkſhire, part of Scotland and Ireland, and the Iſles of Man and Angleſey [10]. Snowdon.

Mr. Pennant does not ſpecify the ſtone that compoſes it (probably a granite); but he obſerves that "large coarſe cryſtals are often found "in the fiſſures, and very frequently cubic pyritæ, the uſual attend-"ants on Alpine tracts." Mr. Aikin in his laſt tour brought ſpecimens from the ſummit, conſiſting of ſchiſtoſe petroſilex mixed with a little ſteatite which ſupports argillaceous ſchiſtus. The petroſilex is in ſtrata nearly vertical: the argillaceous ſchiſtus in beds nearly horizontal. From Snowdon, a line of mountains extends by the ſea to Plenlimmon, a boundary of North Wales, whence iſſue the noble rivers Severn and Wye. Of theſe hills, Urrou Seth, Caer Idris, and Moyle Vadiau, are the moſt memorable. The hills on the Eaſt of North Wales, are far from attaining ſuch conſiderable elevation, and gradually decline to the hills of Shropſhire, of which the Wrekin is one of the moſt noted †.

* Among the ſmaller elevations may be named the Chiltern-hills, (whence the vague office of Steward of the Chiltern Hundreds) reaching from Tring in Hertfordſhire, to Henley, in Oxfordſhire. In the latter county are Nettlebed and Shotover-hills.

[10] Pennant's Journey to London, p. 170.

† Mr. Aikin, in his Tour in Wales, has conſiderably illuſtrated this ſubject. He obſerves (p. 19.) that the Ferwyn mountains occupy the Eaſt ſide of Merioneth, branching into Denbigh and Montgomery; length about ſixteen miles, breadth from five to ten. Cader Idris is the ſecond in height of the Welch mountains (about 3000 feet) and from it extends a primitive chain, running N. N. E. in the Arrans and Arranigs, conſiſting of porphyry and granitell. The ſecond grand ridge, that of Snowdon, alſo runs N. N. E. and conſiſts of ſchiſtoſe hornblende, micaceous ſchiſtus, granite, and porphyry, with ſome large blocks of ſerpentine: this chain extends from Penmaenmawr, towards Traethmawr; and after forming conic peaks at intervals, it ends in the northern horn of Cardigan-bay, that is the ſouthern promontory of Caernarvonſhire.

Mountains. A chain proceeds due ſouth to near Cardiff, in South Wales; it is of far inferior height, and a ſmall branch diverges to the weſt, conſiſting of Cwn Cothy, Mynydd, Carreg, Briſley, and Cwm Kerrun-hills. On the eaſt of South Wales, are the hills of Herefordſhire, the Black Mountain, Cuſop-hill, Hargeſt, Stockley-hill, &c.

In the Northern and Weſtern mountains and hills, chalk is unknown, while it forms a chief material of thoſe of the South and Eaſt. An eminent naturaliſt obſerves, that a line drawn from Dorcheſter, in the county of Dorſet, to the county of Norfolk, would form a boundary of the great chalky ſtratum which interſects the kingdom, none being found in any quantity to the north or weſt of that line[11]. The northern mountains are moſtly compoſed of lime ſtone, free-ſtone, ſlate or ſchiſtus, with mines of lead or coal; thoſe of Derbyſhire preſent vaſt maſſes of lime-ſtone, interſected with thick veins of toad-ſtone, by ſome aſſerted to be the produce of fire, while others aſſign an aqueous origin*, and numerous foſſils and minerals, the conſideration of which is reſerved for a future article. The ſummit of Skiddaw preſents white ſhivery ſlate, or argillaceous ſchiſtus; but ſome of the Weſtmoreland mountains contain ſiliceous ſchiſtus†; and it is probable that granite may exiſt in thoſe of Cheviot. The vaſt baſe of Ingleborough, near 30 miles in circuit, conſiſts of lime-ſtone; on the eaſt ſide full of ſhells to near the ſummit, which is of grit and ſand-ſtone flag; the foſſils, black and brown marble, thin ſlate near Ingleton, rotten-ſtone or tripoli, and ſome lead-ore[12]. And ſuch is this chain to its termination; while

May not the mountains of Weſtmoreland and Cumberland be conſidered as elongations of theſe two chains, that of Snowdon paſſing from the promontory on the weſt of the bay of Lancaſter, by Helvellyn, and ending in Saddleback and Skiddaw; while the other paſſes from near the river Ken, by Shap Fell, &c.?

[11] Pennant's Journey from Cheſter to London, p. 214.

* This toad-ſtone is by the miners called *cat dirt*, but they unluckily apply the ſame name to a very different ſubſtance (a greeniſh lime-ſtone); a circumſtance which has deceived St. Fond, when he aſſerts that lead ore is found in the toad-ſtone, which is never the caſe.

† Called by Houſman (p. 49.) hard grey flint. Fine blue ſlate abounds in Borrowdale. Ib. He ſays, (p 229.) that near the ſummit of Wharn, there is a thin ſeam of coal, and another is ſaid to correſpond with it on a hill on the oppoſite ſide of Dentdale.

[12] Guide to the Lakes, 265. 267.

further to the ſouth, the eaſterly elevations are of chalk; and thoſe on the weſt, as Mendip hills, in Somerſetſhire, are wholly calcareous. The granite begins at Dartmoor, in Devonſhire, and continues through Cornwal, where it occurs of various colours, the grey granite, or moor-ſtone; the red, or Oriental; the white, the yellow, and the bluiſh, or pigeon-coloured [13]. Near the Lizard and Mullion, are rocks of ſerpentine and ſteatites, the latter being alſo found in a ſingular variolite, at Thorverton, between Exeter and Upton Pyne. The china-ſtone, or petunſi, uſed in making fine porcelain, is here a decompoſed granite, the felſpar having become ſoft like lithomarga. Mountains.

The Welch mountains abound in various granites, with large maſſes of quartz and ſerpentine: a French traveller [14], obſerves a ſimilarity between the ſubſtances of the Welch mountains, and thoſe of Wicklow in Ireland, whence he infers a primitive junction. While on the eaſt of England the lime-ſtone ſucceeds the chalk (of which change the noble promontory of Flamborough-head, already deſcribed, affords a ſtriking inſtance) on the coaſt towards Wales, are found granite, and other primitive rocks. The Wrekin, about ten miles eaſt of Shrewſbury, is chiefly compoſed of reddiſh chert, or petroſilex, with ſiliceous ſand-ſtone, baſalt, and a kind of granite [15]. The great coal diſtrict of Colebrook-dale, reſts on indurated clay, while that near Briſtol is accompanied by black freeſtone, and even the calcareous freeſtone near Bath, is interſperſed with numerous veins of coal. The Malvern-hills on the S. W. of Worceſterſhire, run N. and S. about ten miles, and afford many granitic rocks with chert and hornblende ſlate [16]. Theſe few notices muſt ſuffice on the compoſition of the Engliſh mountains, a ſubject which only begins to attract the attention which its curioſity deſerves.

To the reader of poetry, the word *foreſt* conveys the idea of a region replete with thick and tall woods, interſperſed with romantic lawns Foreſts.

[13] Pryce's Mineralogy of Cornwal. Maton's Weſtern Tour, &c.
[14] Coquebert Journ. des Mines. [15] Townſon's Tracts, p. 163. [16] Ibid. 216.

and

Forests.

and murmuring rivulets. But in England a foreſt is ſometimes bare of trees, or not unfrequently only preſents a few withered oaks; and the term is even applied to upland downs and heaths. Many of the foreſts were, even in the Anglo-Saxon times, eſteemed Royal demeſnes; but the Norman monarchs were ſo much addicted to the chace, that upwards of ſixty foreſts at one time, appertained to the crown; of which the chief now remaining are the foreſts of Dean, in Glouceſterſhire, Sherwood, in Nottinghamſhire; Windſor, in Berkſhire; and the New Foreſt in Hampſhire. The royal foreſts conſtituting ſo large a part of the kingdom, of a diſtinct nature, and regulations different from other regions, many grievances aroſe, till the Barons exacted from Henry III. the foreſt charter; in which ſeveral deſpotic laws were revoked, and more equity extended to the neighbouring proprietors and tenants.

Beſides the principal foreſts above-mentioned, other diſtricts ſtill retain the name, as Dartmoor-foreſt, in Devonſhire; Enfield-chaſe, in Middleſex; Witham, and Epping-foreſt, and that of Henault, in Eſſex; Sacy and Wittleborough-foreſt, and Rockingham-foreſt, in Northamptonſhire; Peak-foreſt, in Derbyſhire; Malvern-chaſe and Wyre-foreſt, in Worceſterſhire; Cannock-chaſe, and Neidwood-foreſt in Staffordſhire; Mogg-foreſt, and Clun-foreſt, and that of Hays and Mocktree, in Shropſhire; Macclesfield-foreſt, in Cheſhire; Netherdale-foreſt, and Langſter-chaſe, in the Weſt Riding of Yorkſhire; the foreſt of Galtres, and Arkengarth and Stainmore, and Leyne, in the North Riding; Teeſdale and Weredale-foreſts, in the county of Durham; Roſendale-foreſt, in Lancaſhire; Sleddell and Martindale-foreſts, &c. in Weſtmoreland; Geltſdale and Inglewood-foreſts, in Cumberland.

General Sketch of Britiſh Botany.

Among the numerous ſpecies of vegetables which are natives of Britain, ſcarcely any are adequate to the ſuſtenance and clothing of man. Our frequent rains, our blaſting winds, and the ſcanty portion to which we are ſtinted, of the light and heat of the ſun, deprive us entirely of thoſe vegetable treaſures, which, in the tropical climates, offer themſelves in overflowing exuberance, to ſatisfy the wants and luxurious deſires of their human inhabitants. The never-failing verdure of

of our plains and hills, covered with a rich carpet of graſſes and papilionaceous plants, ſhews how admirably our country is qualified for the ſupport of graminivorous quadrupeds; and we find accordingly that our ancient foreſts abounded in ſtags and roe-deer, as our cleared and cultivated lands do now with ſheep and cattle. This ſeeming partiality of nature, in thus ſcanting to man the ſupply of vegetable food, while it is profuſely offered to the grazing herds of every kind, by obliging the early ſettlers in this iſland to depend for their ſupport, principally on the fleſh of animals, gave them ſtronger motives to perſonal exertion, than an equal ſtate of civilization in a warmer climate, could have afforded. While the native of the tropical regions was receiving from the unpurchaſed bounty of nature, his regular and plentiful ſupply of cocoa-nuts, bananas, and bread-fruit, the Briton was obliged to earn his daily food, by the hard labour of each day, to chaſe the flying deer through the woods, or to diſpute his prey with the boar or the wolf. Thus, by the ſeverity of the climate, and the want of vegetable food, was the firſt germ of exertion ripened into an activity, which, by the combined influence of luxury and neceſſity, has at length laid all the vegetable riches of the globe at our feet. BOTANY.

In the general progreſſion of ſcience, botany has advanced with rapid ſteps, and has been cheriſhed with peculiar fondneſs in our native iſland. The Flora of Britain, though it cannot boaſt the moſt ſplendid and exquiſite of vegetable productions, yet contains as great a variety of genera and ſpecies, as any other country of equal extent. The inveſtigation of indigenous, as well as exotic plants, is continually carrying on here with increaſing ardour, and every year brings new acceſſions to our crowded ranks of native vegetables. It cannot be expected, therefore, that we ſhould give a particular account of each ſpecies, and it would be but little agreeable or uſeful, to offer to our readers a barren liſt of Linnæan nomenclature: we ſhall, therefore, chuſe a middle courſe, by giving a general view of the natural families under which the plants of England arrange themſelves, and particularize by name only, ſuch

Botany. ſpecies, as from their utility or rarity, or other circumſtances, may be worthy of individual notice *.

Graſſes. The firſt for importance and variety is the family of GRASSES. Almoſt every part of the country that is not under tillage, is principally covered with graſs. Under almoſt all the differences of ſoil and ſituation, we find the chief covering of the richeſt, as well as of the moſt barren tracts, made up for the moſt part of theſe plants; to theſe we are indebted for the luxuriant verdure of our paſtures, for the cloſe velvet carpeting of our downs and ſheep-walks, and the more ſcanty clothing of our mountainous diſtricts. Twenty-ſeven genera, and a hundred and ten ſpecies of graſs are natives of our iſland, moſt of them of common occurrence in ſituations where they are found at all. None of them have been proved to be poiſonous, either to man or beaſt, on the contrary, whether freſh or dried, they furniſh a grateful food to all our domeſtic cattle. Thoſe which are found in meadows and paſtures are eſteemed the ſweeteſt and moſt nutritious; but thoſe that are natives of marſhes and wet places are generally the largeſt and moſt luxuriant, and if in quality they be ſomewhat inferior to the preceding, yet the defect is probably more than compenſated by the quantity of herbage that they ſupply. Light ſandy ſoils, eſpecially the flat parts of the eaſtern and ſouthern coaſts, abound in graſſes that are hardly to be met with in the interior of the iſland; the herbage of theſe affords a coarſe and ſcanty paſture, and they are eminently diſtinguiſhed from their kindred ſpecies, by the length and ſtrength of their creeping-roots. The inhabitants of Skey, and the other weſtern iſlands of Scotland, manufacture them into durable ropes: and while growing, they ſerve the very important purpoſe of binding together the looſe ſand, which otherwiſe would be drifted far up the country. Upon the ſides and ſummits of our mountains, are found a few graſſes that do not appear elſewhere, mixed with ſome others of more general occurrence; as however, in theſe bleak and elevated ſituations, covered with ſnow for ſome months in the year, and ſhrowded in clouds for the

* Smith's Flora Britannica.

principal

principal part of the remainder, it would be ſcarcely poſſible for theſe plants to bring their ſeeds to maturity, we obſerve in them a wiſe and ſtriking deviation from the common courſe of nature. Like the reſt of their tribe, they throw up flowering ſtems and bear bloſſoms; but theſe are ſucceeded not by ſeeds, but by bulbs, which in a ſhort time vegetate, and are already furniſhed with a leaf and roots, before they fall to the ground. Botany.

Nearly allied to the graſſes in general habit, are eight genera, comprehending about ninety ſpecies, which are natives of moors, bogs, and pools; they ſerve to give conſiſtency to the deep mud or peat, in which they are rooted, and when young afford a coarſe paſture to ſheep and cattle; ſeveral of them alſo are uſed for matting, thatching, and for chair bottoms. The ſtately-bull-ruſh is one of the principal ornaments of our fens, and neglected pools, and the ſeveral ſpecies of cotton-graſs enliven many a dreary mile of bog, by their gracefully pendent tuft of down.

The Leguminous, or papilionaceous plants, ſo called from their winged bloſſoms, form a very important claſs in Britiſh botany. They are divided into nineteen genera, and ſixty-four ſpecies. The herbage of all when freſh, and of many when dry, is a moſt grateful food to horſes, cattle, and ſheep, and ſeveral of them, as the clovers and vetches, are largely cultivated for this purpoſe. Moſt of this claſs are climbers, and adorn our thickets and hedges with elegant feſtoons of bloſſoms and foliage; and a few have been domeſticated in our gardens and ſhrubberies. Almoſt all the Engliſh papilionaceous plants flouriſh beſt in light calcareous ſoils, either rocky or ſandy; and ſome of them as the Anthyllis vulneraria, and Saintfoin, may be reckoned certain indications of chalk or lime-ſtone. Papilionaceous.

The unbelliferous plants form a large and important claſs in the natural arrangement of Britiſh vegetables, conſiſting of thirty-five genera, and about ſixty ſpecies. The roots and ſeeds of thoſe kinds which grow on dry, light ſoils, are frequently aromatic; thoſe that are natives of marſhes and moiſt meadows, are, for the moſt part, in a greater or leſs degree poiſonous. The whole claſs, indeed, is a ſuſpicious one, and contains ſpecies that are fatal, not only to man, but to Umbelliferous.

Botany. moſt of our domeſtic quadrupeds. The moſt actively deleterious are the following: Conium maculatum (hemlock); Oenanthe crocata (hemlock drop-wort); Cicuta viroſa, (water hemlock). A few ſpecies by dint of cultivation, have been rendered ſerviceable to man, either as food, or on account of their aromatic qualities, and ſome as Caucalis daucoides, and Anethum fœniculum, are certain proofs of a calcareous ſoil.

Labiated. The ringent, galeated, hooded, or labiated plants, hold a conſpicuous place in the Engliſh Flora: of theſe, none, except perhaps the Digitalis (fox-glove), deſerve to be ranked among the poiſonous plants; a conſiderable number, however, exhibit a ſtrong aromatic ſmell, approaching, in ſome caſes, to the fœtid, and poſſeſs other active ſenſible properties. Such are ſpear-mint, pepper-mint, penny-royal and horehound. Our moſt eſteemed pot-herbs belong to this natural claſs, and are many of them natives of England. Theſe are (beſides the mints mentioned above) marjoram, common and lemon thyme, and baſil thyme, all of them abundant in chalky and calcareous ſoils. There are not many very ſhowy plants in this claſs; but the bee nettle; two or three ſpecies of Antirrhinum (ſnap-dragon); and the fox-glove, both purple and white, are eminently beautiful. Some of the vegetables in this claſs have certain peculiarities of ſtructure, which render them worthy of notice. The genus Utricularia, an aquatic, may be diſtinguiſhed from all the reſt, by the numerous ſmall membranous bags, attached to its finely divided leaves that ſerve to ſupport it on the ſurface of the water; the genera, Lathræa (tooth-wort); and Orobanche (broom-rape), are paraſitical, that is, they fix themſelves in the roots of other vegetables, from which they derive their nutriment, being incapable of ſubſiſting if planted in the open ground; they are alſo deſtitute of leaves, conſiſting merely of a fleſhy ſtem, terminated by purpliſh brown flowers.

Liliaceous. Perhaps the moſt ſplendid of all the herbaceous plants, are thoſe with bulbous roots, which, from their general reſemblance to the lily, have obtained the name of Liliaceous; moſt of theſe, however, are natives of warmer climates; the ſandy deſarts about the Cape of Good Hope, and the ſhores of the Indian Ocean, produce the moſt beautiful ſpecies;

ſpecies; of thoſe which are found wild in England, there are only eleven genera, and twenty-eight ſpecies; and the greater number of theſe are of rare occurrence in a truly native ſtate; the ſpring and autumnal crocus, the ſnow-drop, the ſnow-flake, the three kinds of Narciſſus (including the daffodil), the fritillary, tulip, and lily of the valley, as well as three ſpecies of ornithogalum, or ſtar of Bethlehem, are more familiar to us as garden plants, than as natives of our woods and paſtures. Botany.

The Britiſh Roſaceous plants compriſing the claſs Icoſandria of Linnæus, include twelve genera, and forty-one ſpecies. Some of theſe are herbaceous, and others are deciduous trees and ſhrubs. In the firſt diviſion, the moſt worthy of notice are, Spiræa ulmaria (meadow-ſweet); growing plentifully by the ſide of brooks and ditches, and ſcenting the air about Midſummer, with its powerful cloying ſweets; Fragaria veſca (wood-ſtrawberry), perhaps the moſt valuable of our native fruits. Tormentilla officinalis (common tormentil), one of the ſtrongeſt vegetable aſtringents. To the ſecond diviſion belong the moſt beautiful and uſeful of our hedge-ſhrubs, the bullace and black-thorn, hawthorn, crab, and mountain aſh; ſeveral ſpecies of wild roſe and bramble. The cherry, the medlar, the ſervice, and pear-trees, whoſe fruit, when wild, is of ſo little account, and of ſuch value when improved by cultivation, belong alſo to this claſs. The burnet-roſe, and white beam tree, are certain indications of calcareous ſoil; and, indeed, almoſt the whole claſs thrive beſt on limeſtone. Roſaceous.

The Tetradynamious, or cruciform plants, compoſe a large natural claſs, entirely diſtinct from any other, the individual ſpecies, however, of which, have ſo many common features of reſemblance, as to render it, in ſeveral caſes, by no means eaſy to aſcertain their ſpecific differences. The taſte of all theſe is more or leſs acrid, but none are poiſonous: they are found to be peculiarly grateful to ſailors who have been long at ſea, and thereby have contracted the ſcurvy; on this account theſe vegetables have obtained the name of antiſcorbutics; their hot biting flavour is the moſt intenſe in wet ſeaſons, and in a ſwampy ſoil, and is remarkably mitigated by cultivation in light ſandy ground. Cruciform.

Twenty-

Botany. Twenty-three genera, and ſixty-two ſpecies, are natives of Britain. The moſt worthy of notice are the ſeveral kinds of Lepidium, or pepper-wort; of Cochlearia, including the ſcurvy-graſs and horſe-radiſh; of Braſſica, containing the colewort, field-cabbage, coleſeed, and turnip, of Sinapis, including the white and common muſtard; ſea-kale, and water creſs; all theſe are wholeſome and agreeable vegetables, either in ſallads or boiled. Woad is worthy of mention, as a dyeing drug, anciently uſed by the Britons for the purpoſe of ſtaining their ſkins, and in ſome eſtimation even at preſent, as a ſubſtitute for indigo. The only native cruciform plant adopted into our gardens, is Cheiranthus cheiri (wall-flower); if, indeed, it be not rather to be conſidered as of foreign origin.

Radiated. One of the largeſt of the natural claſſes of Engliſh vegetables, is that of the radiated or compound flowered plants. Forty genera, and 120 ſpecies, belong to this claſs. It is rather remarkable, that out of ſo large a number of plants, many of which are very abundant, and of great ſize, only a ſingle one, the Tragopogon porrifolius (ſalſafy), ſhould be applied to the ſuſtenance of man, and not even a ſingle one ſhould be cultivated for the uſe of cattle; more eſpecially as the Lactuca viroſo (ſtrong-ſcented lettuce), is the only ſpecies poſſeſſed of deleterious properties. Moſt of them have an ungrateful bitter taſte, and the ſuculent ones contain a white milky juice, of an acrid flavour. Of all our native vegetables, they are the commoneſt, thriving by neglect, and multiplying under perſecution; the farmer and gardener are unceaſingly employed in their deſtruction, for they contribute little or nothing to the ſupport of man, and the larger quadrupeds; nor is the beauty of their appearance ſuch, as to obtain for them a place in the flower-garden. The annual kinds, however, producing vaſt multitudes of ſeeds, and the perennial ones being furniſhed with long and deeply ſtriking roots, there is no fear of their extermination; they occupy road ſides, ditch banks, and all waſte places that are incapable of cultivation, and ſeem peculiarly devoted to the ſuſtenance of the granivorous birds, by their ſeeds, and of numerous tribes of inſects, by their foliage. The ſow-thiſtle, hawkweed, burdock, thiſtle, coltsfoot, groundſel, dandelion,

and daiſy, are the moſt commonly occurring genera; a few, as the chamomile, worm-wood, and elecampane, are employed in medicine. The daiſy, and butter-bur (Tuſſilago petaſites), are generally the firſt bloſſoms of the ſpring, and on that account are beheld with greater ſatisfaction than more ſhowy plants. Botany.

The Britiſh genera of the Orchis tribe are five in number, and comprehend between thirty and forty ſpecies. They are all either ſingular or beautiſul plants, and would no doubt be more frequently introduced into our gardens, if they were of eaſier cultivation. They are of but little account as food for cattle, but the roots of the bulbous kinds abound in a mild farina, which might be uſed for human nutriment; the ſaloop of the ſhops is the powdered root of a ſpecies of orchis that is found in Turkey. The Ophrys anthropophora (man orchis); Ophrys myodes (fly orchis); Ophrys apifera (bee orchis); Ophrys aranifera (ſpider orchis), are the moſt ſingular for the form of their bloſſom, the general appearance of which is expreſſed by their trivial names. A few are remarkably fragrant, eſpecially in the cool of evening; theſe are Orchis bifolia (butterfly orchis); Orchis conopſea; Ophrys monorchis (muſk orchis). Several grow in wet boggy places, but by far the greater part are inhabitants of calcareous diſtricts; the county of Kent in particular, is remarkably rich in them. Orchis.

Such of our trees and ſhrubs as have not been already mentioned, may be conſidered as forming a peculiar claſs, and one of great importance; it is naturally ſubdivided into the evergreen and deciduous. Trees.

The moſt valuable of our native evergreens, are the box, the pine, the yew, and the holly; thoſe of ſecondary conſequence, are the juniper, the ivy, the cranberry, and thoſe extremely ornamental plants, the Vaccinium vitis idæa (red whortle berries); and Arbutus uva urſi (bear-berry). Evergreens.

The deciduous timber-trees that are either aboriginal, or at leaſt have been long naturalized to our ſoil, are the oak, the cheſnut, and beech, all of which are *maſt-bearing trees*, or produce farinaceous oily nuts, the favourite food of hogs, and of many graminivorous quadrupeds; the birch, the alder, the hornbeam, the abele, the black poplar, and the aſpen, bearing catkins; the ſycamore, the maple, and the aſh; the lime, Deciduous.

Botany. lime, the elm, and wych hazle. A middle ſtation between the timber-trees, and ſhrubs, is occupied by the hazle, and the numerous ſpecies of willow. The pulpy fruit-bearing ſhrubs are, the currant and gooſeberry, the elder, the barberry, the cornel, or dogwood, the buckthorn, the guelder-roſe, and mealy-tree, and the Mezereon; the four firſt are wholeſome and grateful to the palate, the reſt are either inſipid or noxious. The four kinds of heath are low, ſhrubby plants, that form the moſt ſplendid ornaments of our bogs or moors.

Ferns. The ferns comprize a number of elegant plants that grow in moiſt, ſhady, and uncultivated places, the uſes of which have been but little enquired into; eleven genera, and about forty-four ſpecies, are natives of Britain; the roots of moſt abound in a mild ſweetiſh mucilage, which in times of ſcarcity has been reſorted to for nutriment; the larger and commoneſt kinds, ſuch as common fern or brakes, are collected and burnt for the potaſh, which is yielded from their aſhes; the ſtem of the Equiſetum hyemale (ſhave-graſs), is much uſed by turners and cabinet-makers, as a fine file to ſmooth their work with.

Moſſes. The ſmalleſt of vegetables, the moſſes, are at the ſame time the moſt numerous; ten genera, and nearly 200 ſpecies are found in the Britiſh iſlands. To man and the larger animals, they appear to be of little or no uſe; low and ſhady places are in general over-run with them, and on walls, and hard dry banks, where other plants are unable to vegetate, theſe readily gain a ſettlement; by the decay of ſucceſſive generations, a ſufficient depth of ſoil is at length formed for the nutriment of other vegetables, and this is, perhaps, the principal advantage derived, at leaſt by man, from the exiſtence of theſe plants.

Lichens. Thoſe cruſtaceous, and leather-like plants, which cover the ſides of walls and rocks, and abound on dry heaths, form the claſs of lichens, nearly as numerous as the preceding one; their general uſe in the œconomy of nature, ſeems to be nearly the ſame as that of the moſſes; the ingenuity of man has, however, applied them to ſeveral other purpoſes. The Iceland lichen, when boiled in water or milk, produces a kind of gruel of little account in this country, but in Iceland forms an important part of the food of the inhabitants; the Lichen prunaſtri, ſerves as the baſe of ſeveral ſcented powders; that beautiful but fugitive

crimſon dye, the archil, is prepared in England from the Lichen parellus, and L. calcareus (Dyer's lichen). Several others are employed by the peaſants of Wales, Derbyſhire, and the North of England, in dyeing their home-made woollen cloths. Botany.

The claſs of Fungi includes ſeventeen genera, and ſeveral hundred ſpecies of native vegetables, almoſt all of which are abandoned to neglect; in France and Italy ſeveral kinds are collected for the table, and are reckoned ſome of its principal delicacies; in this country they lie for the moſt part under the obloquy of being poiſonous, ſo that only the four following are uſed, viz. Chanterelle and common muſhroom, Morell and Truffle. Fungi.

The laſt claſs of Engliſh vegetables, is that of the marine Algæ, or ſea-weeds. Four genera, and between two and three hundred ſpecies are found upon our own ſhores; the more tender and gelatinous kinds are eaten either raw or boiled, and the reſt on thoſe rocky parts of the coaſt, where they can be collected in great quantities, are burnt into kelp for the uſe of the ſoap-boilers and glaſs-makers. Sea-weeds.

Mr. Pennant, in his Britiſh Zoology, has treated this ſubject at due extent, and with his uſual ability. The nature of this work will only admit of a few imperfect notices. Of animals, that celebrated author enumerates twenty genera, from the horſe down to the ſeal and bat. The birds extend to forty-eight, the reptiles to four, and the fiſh to forty genera, beſides the cruſtaceous and ſhell fiſh. Zoology.

That noble and uſeful animal, the Horſe, is found in England of many mingled breeds, while moſt other kingdoms produce only one kind[11] Our race-horſes deſcend from Arabian ſtallions, and the genealogy faintly extends to our hunters. The great ſtrength and ſize of the Engliſh draught-horſes, are derived from thoſe of Germany, Flanders, and Holſtein; and other breeds have been ſo intermingled, that native horſes may be found adapted to every purpoſe of pomp, pleaſure, or utility. Thoſe of Yorkſhire are particularly celebrated for their ſpirit and beauty; and the grooms of that county are equally noted for their ſkill in the management of this valuable animal. It is ſome-

[11] Pennant's Zoology, vol. i. p. 1.

Zoology. what remarkable, that while England excels all the European countries in various breeds of horſes, yet veterinary ſchools are of recent inſtitution. The ſpeed of Childers was computed at a mile in a minute; and ſuch is the ſtrength of a Yorkſhire pack-horſe, that he will uſually carry 420 pounds; nay, a mill-horſe will ſupport for a ſhort diſtance, a weight of 910 pounds. Mr. Pennant obſerves, that though the Britiſh cavalry was remarkable, even in the time of Julius Cæſar, yet we know not what was the primitive breed.

The indigenous breed of horned cattle, is now only known to exiſt in Neidwood-foreſt, in Staffordſhire, and at Chillingham-caſtle, in Northumberland. They are long-legged and wild like deer, of a pure w hitecolour, with black muzzles, ears, and tails, and a ſtripe of the ſame hue along the back. The breeds of our cattle are almoſt as various as thoſe of our horſes; thoſe of Wales and Cornwall are ſmall, while the Lincolnſhire kind derive their great ſize from thoſe of Holſtein. In the North of England we find kylies, ſo called from the diſtrict of Kyle, in Scotland; in the South we find the elegant breed of Guernſey, generally of a light brown colour, and ſmall ſize, but remarkable for the richneſs of their milk. Of late years Mr. Bakewell, and others, have brought the breeding of cattle and ſheep to a regular ſyſtem.

The number and value of ſheep in England, may be judged from the ancient ſtaple commodity of wool. Of this moſt uſeful animal ſeveral breeds appear, generally denominated from their particular counties or diſtricts; thoſe of Herefordſhire, Devonſhire, and Cotſwold downs, are noted for fine fleeces, while the Lincolnſhire and Warwickſhire kind, are remarkable for the quantity. The Teeſdale breed of the county of Durham, though lately neglected, continue to deſerve their fame. The wool is beautiful, but the length of their legs leſſens their value in the eyes of the butcher. The mutton of Wales, on the contrary, is eſteemed, while the wool is coarſe, yet employed in many uſeful and ſalutary manufactures. The Norfolk breed is remarkable for black faces and legs. Thoſe of Leiceſterſhire are very large, and without horns.

The moſt laudable exertions have lately been made by the Board of Agriculture, and by individuals, for the improvement of the Engliſh fleece. ZOOLOGY.

The goat, an inhabitant of the rocks, has, even in Wales, begun to yield to the more uſeful ſheep; that country being, like Scotland, more adapted to the woollen manufacture. It is to be regretted that ſome means are not diſcovered of preventing the goat, an uſeful animal to the poor, from being ſo deſtructive to plantations and agriculture. The breeds of ſwine are various and uſeful.

England alſo abounds in breeds of dogs, ſome of which were celebrated even in Roman times. In the reign of Elizabeth, Dr. Caius or Kay enumerates ſixteen denominations of Engliſh dogs. Some ſeem to be now extinct; and the blood-hound only occurs in Staffordſhire. The terrier, as the name implies, was uſed to force the burrowing animals from their holes; the harrier, a-kin to the fox-hound, for hunting the hare. The grey-hound was ſo called, as Caius informs us, becauſe he was the firſt in *degree* among dogs. The tumbler of that author ſeems to be our lurcher. The ſpaniels from Spain, as the name imports, were trained as ſtarters, ſetters, and pointers, but the latter deſcription is modern; the water-ſpaniel was uſed to recover the ſlaughtered game; the ſpaniel gentle, or comforter of Dr. Caius, is our lap-dog; the ſhepherd's dog is Buffon's fanciful father of the whole canine progeny, and always diſplayed its docile qualities. The maſtiff, or *amaze thief*, was employed in defending the houſe: to this ſpecies Mr. Pennant aſcribes the bull-dog, an animal of ſurpriſing ſpirit and fierceneſs. The curs and mongrels are numerous; but the turnſpit is now exploded. Of late the Newfoundland-dog, of more uſeful and generous qualities, has, in ſome degree ſupplanted the maſtiff: and the ſpotted Dalmatian forms an additional attendant on an equipage.

The cat is one of the moſt univerſal, and moſt identic of animals, thoſe of Angola excepted, with their white fleeces, and thoſe of Ruſſia with a bluiſh fleece, and eyes of topaz.

Of our ſavage animals the moſt fierce and deſtructive is the wild cat,

Zoology. which is three or four times as large as the domeſtic, with a flat broad face, colour yellowiſh white, mixed with deep grey, in ſtreaks running from a black liſt on the back; hips always black, tail alternate bars of black and white; only found in the moſt mountainous and woody parts. The wolf has been long extinct, but the fox abounds. It is ſufficient to name the badger, the fitchet, the martin, the ſtoat, or ermin, the otter, ſquirrel, dormouſe, rat (the native, or iron grey, has lately almoſt vaniſhed before the brown kind of India, falſely called the Norway rat), and various kinds of mice. The mole, urchin, and bat, ſeem to become more rare; the ſeal is chiefly found on the coaſt of Wales.

In the parks of the great, the roe is now extinct, but fallow deer abound, of great beauty, and the red deer; the latter are known by the terms, ſtag, hind, young, or calf; while the former are ſtyled buck, doe, and fawn; the red kind are more vicious than the other, and becoming more uncommon.

The chief of our birds of prey, are the golden eagle, ſometimes found on Snowdon; the black eagle has appeared in Derbyſhire; the oſprey, or ſea eagle, ſeems extinct in England. The peregrine falcon breeds in Wales; and many kinds of hawks in England. An enumeration of the other birds would be ſuperfluous. The nightingale, one of the moſt celebrated, is not found in North Wales, nor any where to the North, except about Doncaſter, where it abounds; nor does it travel ſo far weſt as Devonſhire and Cornwall [14]. This limitation is remarkable, as theſe birds are found in the ſevere climate of Sweden. Our poultry ſeem to originate from Aſia; our peacocks are from India; our pheaſants from Colchis, the guinea-fowl (the Meleagrides, or Numidian hens of the ancients) are from Africa. Our ſmalleſt bird is the golden-creſted wren, which ſports on the higheſt pine-trees; and our largeſt the buſtard, ſome of which weigh twenty-five pounds, and are found in the open countries of the ſouth and eaſt. But this bird ſeldom appears; and our turkeys, originally from America, richly ſupply

[14] Pennant's B. Z. I. 360.

the defect; the largeſt are reared in Norfolk and Suffolk. One of the moſt ſingular of our water fowl is the long-legged plover: the moſt uſeful the mallard or wild duck, which is chiefly caught in the fens of Lincolnſhire; the numbers ſent to the capital, almoſt exceed credibility. Zoology.

The reptiles are the coriaceous tortoiſe, frogs, toads, ſeveral kinds of lizards: of our ſerpents the viper alone is venomous; other kinds are the ringed ſnake, ſometimes found four feet in length; and the blind worm, ſeldom exceeding eleven inches.

Of fiſh, the whale ſeldom appears near the Engliſh coaſts, nor the dolphin; the porpeſs, and others of the ſame genus are not uncommon. The baſking ſhark appears off the ſhores of Wales. Numerous are our edible-ſea-fiſh. Some of the moſt celebrated are the turbot, doree, ſoal, cod, plaice, ſmelt *, mullet, &c. &c. The conſumption of herrings and mackarel extends to moſt parts of the kingdom; but pilchards are confined to the Corniſh coaſts. Our chief river fiſh are the ſalmon and the trout, which are brought from the northern parts in prodigious numbers, generally packed in ice; but ſometimes the trout are brought alive, in veſſels provided with a well or baſon for that purpoſe. It is ſaid that not leſs than 30,000 ſalmon are brought from one river, the Tweed, to London, in the courſe of a ſeaſon. The lamprey, though a ſea-fiſh, is chiefly found in the Severn; it reſembles the eel, but has a line of ſeven apertures near the head. The charr is chiefly found in the lakes of Weſtmoreland, the ſides ſprinkled with red ſpots. The umber, or greyling, ſomewhat reſembles the trout. The ſamlet is the ſmalleſt of the trout kind, and has erroneouſly been ſuppoſed the young of the ſalmon; in Scotland it is called the par. Our carps are from Poland, and the inferior ſort from Pruſſia: the tench and perch are eſteemed by ſome as dainties of the table.

The lobſter is found on moſt of the rocky coaſts, particularly off Scarborough. This cruſtaceous fiſh has ſingular habits; with its blunt claw it maintains its ſituation, while that with ſerrated pincers divides its

* Mr. Pennant, iii. 371. ſuppoſes white bait to be the young of the bleak.

food;

Zoology. food: the claws are reproduced, though not so large as the first; they change their shells every year. The craw-fish is a small kind of lobster, which dwells in the clayey banks of rivers. Of shell fish, the pearl mya, a large kind of mussel, was found in the Conway, in Wales, and the Irt, in Cumberland; but it seems now confined to Ireland and Scotland. Pearls arise from the perforation of a kind of worm, and may be produced artificially, by boring the shell, and replacing the mya in the water[n]. The English oysters maintain their Roman reputation; but they seem to yield in flavour to those of more northern countries. The green from Colchester, in Essex, and the juicy white from Milton, in Kent, have the chief reputation.

Mineralogy. It seldom or never happens that countries, abundant in the productions of agriculture should, at the same time, present an opulent mineralogy. Yet England is far from being deficient in this respect.

The tin mines in Cornwall have been already mentioned; and they are not only venerable from their antiquity, but are, it is supposed, the richest of the kind in the world. Tin is also found in Bohemia, Saxony, and Hungary, and in the Oriental regions of Malacca, Banca, and Siam, but not in such lasting exuberance as in the Cornish mines. That kind of silver, termed by mineralogists horn-ore, is also found in that district; but the profound secrecy observed in working it, forbids any investigation of the amount. The Huel rock boasts of what is called bell metal ore; and of wolfram *.

Cornwall also produces copper at Redruth, Alstone, and the Land's End. The same metal is found in Yorkshire, and Staffordshire; but no where in such abundance as in the Parrys mountain, in the north-

[n] Pennant, B. Z. iv. 80. St Fond. II, 190. But this circumstance is doubtful, as may be observed in the account of Ceylon, in the second volume of this work.

* Mr. Maton informs us, that *Huel* (pronounced Whele) means a *mine*; that the tin pebbles form strata, in blueish marl, mixed with sand and marine spoils; and the richest mine is at Polgooth, two miles S. W. of St. Austle. (Western Tour.) *Opal* is found in yellow copper ore at Roskeir, Ibid.

west

weſt of Angleſea[16]. Inſtead of deſcending in veins through various rocky ſtrata, the uſual form of metallic ores, it here forms a prodigious heap, and is worked in the manner of a quarry. The mountain is almoſt bare of ſhrubs or graſs; and is covered with aluminous ſlate, under which, in grey chert, is the ore, being chiefly the yellow ſulphurate, which yields a quarter of copper, and a quarter of ſulphur, the remaining half being refuſe. This valuable mine was diſcovered about thirty years ago. MINERALS.

Lead is found in the Mendip-hills, Somerſetſhire; which alſo produce calamine and manganeſe. The lead-mines in Derbyſhire are well known, not only for that metal, but for the beautiful veins of fluor, which accompany it, and which is manufactured into ſeveral ornamental articles. In general the northern central ridge of mountains, abounds with lead-ore. The lead-mines of Aldſton, on the eaſtern verge of Cumberland, employ about 1100 men.

No metal is ſo widely diffuſed through the globe as iron, and England not only contains excellent mines, but excels all nations in the variety of fabrication. The moſt remarkable mines of iron, are thoſe of Colebrook-dale in Shropſhire, Dean-foreſt in Glouceſterſhire, with ſome in the north of England, particularly near Ulverſton, in Lancaſhire.

Among the minor metals, zinc, in the form of lapis calaminaris, and blend, is found in Derbyſhire, Cornwall, and other regions. Nicke and arſenic ſometimes appear in Cornwall; and recently, what is called menachanite. But one of the moſt important of this kind is plumbago, or black lead, which is found in the ridge of Borrodale, near Keſwick, in Cumberland: the mine is only opened at certain intervals of time.

Gold has been diſcovered in various quarters of England, particularly near Silſoe, Bedfordſhire; but the metal has never recompenſed the labour and expence[17]. The real gold mines of England are thoſe of coal, found in the central, northern, and weſtern parts, but particularly in the northern, around Newcaſtle. This ſubſtance is a mixture of car-

[16] Aikin's Wales, 133. [17] Gough's Camden, i. 330.

bon

Minerals. bon with bitumen, which laſt abounds in the Newcaſtle coal, and is the cauſe of its coaleſcing when inflamed [18]. An ingenious traveller has aſcribed the whole opulence of England to her coal, as being the very ſoul of her manufactures, and conſequent commerce [19]. The coals of Whitehaven and Wigan are more pure; and the cannel and peacock coals of Lancaſhire, are ſo beautiful, that they are ſuſpected by ſome to have conſtituted the *gagates*, or jet, which the ancients aſcribed to Britain *. A ſingular ſpecies of coal is found in Bovey-heath, Devonſhire, reſembling wood impregnated with bituminous matter. Turf or peat is common, even in Hampſhire, and other ſouthern counties.

Salt Mines. The mines of rock ſalt, in Cheſhire, muſt not be omitted. They appear to have been known to the Romans, as a place called *Salinae* is here mentioned by the geographer of Ravenna. Leland has deſcribed them in the time of Henry VIII.; nor were they unknown even in the Saxon periods. Thoſe of Northwich are the moſt remarkable: at Namptwich and Middlewich, are only ſalt-ſprings; and others occur at Droitwich, in Worceſterſhire, and Weſton, in Staffordſhire. The immenſe mines on the ſouth ſide of Northwich, were diſcovered about the beginning of this century. The quarries, with their pillars and cryſtal roof, extending over many acres, preſent a beautiful ſpectacle; the ſtratum of ſalt lies under a bed of whitiſh clay, at the depth of about forty yards. The firſt ſtratum is about twenty yards thick, ſo ſolid as to be blaſted with gunpowder, this ſalt reſembles brown ſugar-candy. Next is a bed of hard ſtone, under which is a ſecond ſtratum of ſalt, about ſix yards thick, ſome parts brown, others as clear as cryſtal. The Witton pit is circular, 108 yards in diameter, the roof ſupported by twenty-five pillars, each containing 294 ſolid yards of rock ſalt; the whole covering near two acres of land. The annual

[18] Kirwan's Min. II. App. but Mr. Hatchett has evinced a mixture of vegetable matter. The Briſtol coal, ſo abundant at Kingſwood, burns more rapidly than that of Newcaſtle.

[19] Faujas de St. Fond.

* True jet is ſaid to be found in Lincolnſhire; it abounds in the ſouth of France, and north of Spain, being palpably ancient timber.

produce

produce of rock ſalt at Northwich, has been eſtimated at 65,000 tons; of which about two thirds uſed to be exported to Flanders and the Baltic[51]. MINERALS.

Marbles, and free-ſtone, or calcareous ſand-ſtone, of various colours and textures, alſo occur; the moſt celebrated of the latter are thoſe of Portland, Purbeck, &c. Fine alabaſter appears in Derbyſhire; fullers-earth in Berkſhire, and ſome other counties.

Nor is England leſs productive of mineral waters, of various properties and deſcriptions. Thoſe of Bath have been celebrated ſince the Roman times. Next to that place of faſhionable reſort, may be mentioned the hot-wells of Briſtol, thoſe of Tunbridge in Kent, and of Buxton and Scarborough in the North. Thoſe of Cheltenham in Glouceſterſhire, have been eſteemed beneficial in ſcorbutic caſes; but to enumerate the ſprings of inferior note, would be infinite, as chalybeat wells at leaſt muſt occur in almoſt every county, and new waters are daily ſtarting into celebrity. Mineral Waters.

Among the natural curioſities, thoſe of Derbyſhire have always been eſteemed the moſt memorable. Hobbes and others have long ſince celebrated the wonders of the Peak, a mountain not equal in height to thoſe of Wales, or the more northern part of England, but perforated with ſuch vertical chaſms, and ſuch ſurpriſing caverns as have deſervedly excited admiration. Theſe caves are often interſected by ſubterraneous waters; and mineralogiſts ſeem to aſcribe their formation to this cauſe, the rock being of calcareous ſtone. Theſe ſubjects have now become too trite and familiar to allow further deſcription; and it ſhall only be obſerved, that the cavern at Caſtleton, now decently called Peak's hole, is of a vaſt extent, and preſents ſingular aſpects, while Poole's hole, near Buxton, is celebrated for its lofty roof, and curious ſtalactites. Near Eyam is Bamforth-hole, a ſtalactitic cavern of conſiderable extent[52]. Natural Curioſities

[51] Pennant's Journey from Cheſter to London, p. 26. (He eſtimates the duty at 20,000l.) Gough's Camden, ii. 436. Aikin's Mancheſter, 427.

[52] Aikin's Mancheſter, p. 76. St. Fond, tom. ii.

NATURAL CURIOSITIES.

Other remarkable caverns are found in the northern ridge of Engliſh mountains. In the vale of Kingſdale, on the weſtern extremity of Yorkſhire, is Yordas cave, which preſents a ſubterraneous caſcade; this cave is about fifty yards in length. But the moſt noted is Wethercot cave, not far from Ingleton. It is ſurrounded with trees and ſhrubs, in form like a lozenge, divided by an arch of lime-ſtone, paſſing under which you behold a large caſcade, falling from a height of more than twenty yards; the length of this cave is about ſixty yards, the breadth thirty. The vaſt limeſtone baſe of Ingleborough is perforated in all directions like a honeycomb. It is the River Weaſe, or Greta, which pervades the cave at Wethercot, and another at Gatekirk, and runs not leſs than two miles under ground. This ſtream muſt not be confounded with the Greta, which falls into the Tees near Barnard-caſtle, and riſes near Brough, in Stanmore; two rivers, the Ouſe and the Swale, running betwixt them. Among other curioſities in this neighbourhood, muſt not be omitted Hurtlepot, a round deep cavity, near forty yards in diameter, almoſt ſurrounded with rocks, about thirty feet perpendicular, above its black waters, while the overbranching trees increaſe the horrors of the ſcene[24]. Not far to the ſouth-eaſt, is a lake called Malham Tarn, of clear and very cold water, abounding in trout. This is the ſource of the river Aire, which runs about a mile under ground; and near it is Malham cove, a kind of amphitheatre, of ſmooth perpendicular limeſtone, about 280 feet high in the centre. The river Ribble, near its origin in theſe parts, alſo ſinks into a deep cavern; and ſilently pervades the mountains for about three miles. Near Settle, at the bottom of ſome calcareous rocks, is one of the moſt remarkable ebbing and flowing wells in the kingdom[25]. This diſtrict alſo abounds with rare and curious plants: and in the grand features of nature, exceeds any other region in England or Wales *.

The

[24] Weſt's Guide to the Lakes; and a curious pamphlet on the caves of Yorkſhire, 1781, 8vo. By Houſman's Map, this Greta paſſes by Ingleton to the Lon and Lancaſter.

[25] Aikin's Mancheſter, p. 91.

* Mr. Houſman alſo gives a good account of theſe curioſities, he obſerves, p. 26, that rocks are in Cumberland called *Linns* (whence the name is in Scotland applied to a cataract); and Sour

NATURAL. CURIOSITIES.

The lakes of Cumberland form another grand ſcene of attraction, but it would be idle to attempt to depict, in a few words, beauties which have been deſcribed by ſo many authors, and particularly by the glowing pencil of a Gray. Suffice it to obſerve, that the three moſt celebrated lakes are thoſe of Coniſton, Windermere, and Derwent. The beauties of the firſt have been compared to the delicate touches of Claude; the noble ſcenes of the ſecond, to thoſe of Pouſſin; while Derwent has much of the ſublime mildneſs of Salvator Roſa: but moſt travellers eſteem Ulſwater the moſt truly ſublime.

The mountainous regions of Wales may well be ſuppoſed to preſent many natural curioſities; and the Parry's mine in Angleſea is in itſelf a ſurpriſing object. The cataracts in Cumberland are rivalled by a remarkable fall of the Tees, on the weſt of the county of Durham, over which is a bridge ſuſpended by chains, ſeldom paſſed but by the adventurous miners; nor muſt Aſgarth force, in Yorkſhire, be paſſed in ſilence.

Near Darlington, in the county of Durham, are three pools of great depth, about thirty yards, called Hell Kettles, concerning which many fables have been current, as is uſual with all nations, concerning any natural phœnomena. The cliffs near Sunderland conſiſt of a ſingular ſtone, reſembling coraline productions; and ſo firm as to be generally uſed there in building *.

The ſub-marine relics of a foreſt, on the coaſt of Lincolnſhire, may be deſervedly claſſed among the moſt remarkable natural curioſities. Nor are the lofty chalk cliffs of Dover without their claim. The cavern near Ryegate, in Surrey, deſcending through a hill of the fineſt and moſt ſplendid ſand, muſt rather claim an artificial origin. At Broſely, in Shropſhire, was a well ſo impregnated with bitumen, that, on the

Sour Milk Force, near the bottom of Buttermere lake, is ſuppoſed to fall upwards of 300 yards. A curious cave was lately diſcovered, p. 83, by miners near Croſsfell, ſaid to be two miles in length, and full of ſplendid ſpars. Gordale Scarr, p. 199, near Malham cove, is a dreadful rent through high rocks, worthy of the attention of a curious traveller.

* The like ſtone occurs in Ingria, and the palace of Peterhoff is conſtructed with it. The Ammonitic ſtone of Broad Marſton, Somerſetſhire, is another ſingular production.

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NATURAL CURIOSITIES.

application of a candle, the ſtream took fire, and would boil a tea kettle in nine minutes[26]; but, by opening other coal-pits in the vicinity, this phœnomenon diſappeared; a ſimilar appearance and event alſo occurred in Lancaſhire[27]. But Shropſhire ſtill contains a remarkable well of bitumen, at a place thence ſtyled Pitchford. Cheddar cliffs, in Somerſetſhire, may alſo be mentioned among the natural curioſities; and the Mendip-hills are not without their caverns, particularly Wookey-hole, near Wells, a ſtalactitic cavern of about 600 feet in length, divided by low paſſages into various apartments; one of which, called the hall, ſomewhat reſembles a Gothic chapel, and is ſaid to be eighty feet in height; while the furtheſt, ſtyled the parlour, it of moderate height, but extenſive diameter. On the N. W. ſide of the Mendip-hills, is a yet more remarkable curioſity, a conſiderable cavern, at the bottom of a deep ravine, near the little village of Berrington, or Burrington. Here are a number of human bones, gradually incorporating with the lime-ſtone rock; there being a continual dripping from the roof and ſides, which depoſits a ſtalactitic ſediment on the bones. Several nodules contain perfect human ſkulls. At the further end, where the height is about fifteen feet, there is a large conic ſtalactite, which nearly meets a pillar riſing from the floor. This cave was only diſcovered about two years ago; and as the matter increaſes ſo faſt, it is conjectured that it would ſoon have been cloſed up[28]. Hence it is probable that theſe bones are of no remote antiquity, and may, perhaps be the remains of ſome wretches who had here taken ſhelter from the cruelty of Jeffries, after the inſurrection of Monmouth *.

[26] Phil. Tranſ. No. 334. and 482. [27] Gough's Camden, II. 397. 412.

[28] Tranſact. of the Linnæan Society, vol. v. Philoſoph. Mag. vii. 146.

* There is a remarkable cave, or rather pit, ſuppoſed to have been an ancient mine, called Penpark-hole, about five miles to the north of Briſtol. A pamphlet, publiſhed by Mr. Catcott contains the dimenſions of this horrible chaſm, and an affecting account of the fate of Mr. Newnam, who fell into the gulph while he was meaſuring its depth.

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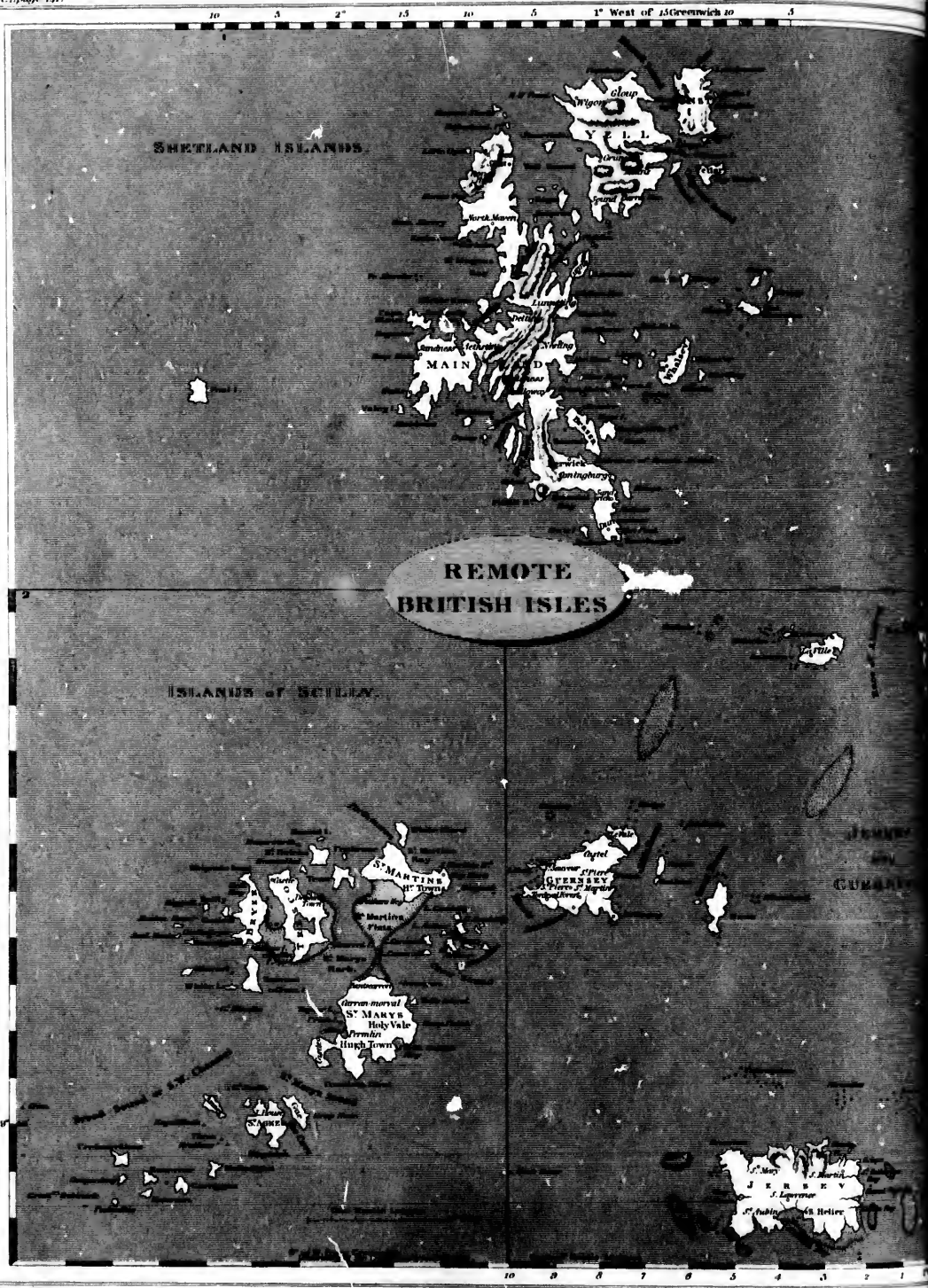

Arrowsmith direxit.

1. From Donelly and others. 2. From various charts. 3. From Delaye.

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ENGLISH ISLES.

In the Southern, or English Channel, first appears the Isle of Wight, by the Romans called *Vectis*, by the Saxons *Vihtlond*, of an oval form, about twenty miles in length, and twelve in breadth. This isle is fertile and beautiful, and decorated with many picturesque villas; the principal haven is that of Newport. The chief mineral products are pipe clay, and fine white sand, for the fabrication of pure glass; and at Alum-bay, on the north side of the Needles, are found considerable quantities of native alum [1]. It is said that more corn was once raised in the Isle of Wight in one year, than the inhabitants could consume in eight. One of the most remarkable buildings is Carisbrook-castle, where Charles I was imprisoned; it was built soon after the conquest, as appears from the Book of Doomsday. The lofty white rocks, styled the Needles, seem to have been disjointed from the western extremity of the isle, by the violence of the waves. There were formerly three; but about the year 1782, the tallest, which rose about 120 feet above the low-water mark, was overthrown, and totally disappeared [2]. Isle of Wight.

At the distance of about seventy miles from Wight, to the S. W. arises the little isle of Alderney, off the Cape la Hogue; which is afterwards followed by the more important isles of Guernsey, and Jersey; Sark being a small isle interposed between the two latter. Guernsey, the largest of these isles, is twelve miles long, nine broad, and about thirty-six in circuit. It is a verdant isle, though the soil be hilly, and barren of wood. The only town is that of Port St. Pierre *. Jersey is about twelve miles in length, and six in breadth, a well watered and fertile island, producing excellent butter and honey. The winters are milder, but more windy, than those of England. The breed of sheep, Guernsey. Jersey.

[1] Gough's Camden, i. 143. [2] Worsley's Isle of Wight, p. 274.

* Guernsey is chiefly remarkable for its small breed of cattle.

with

British Isles.

with four or six horns, seems now unknown. The northern side of the island is high, but the southern subsides into pleasant vales, covered with orchards. It is said that this isle has sometimes produced in one year 24,000 hogsheads of cyder. The remarkable places are the two towns of St. Helier and St. Aubin, both standing on a bay, opening to the south; and the castle of Mont Orgueil. The inhabitants of Jersey are computed at 20,000, of which 3000 are capable of arms. In January 1781, St. Helier was surprised by 800 French under Rullicourt, who was killed, while Major Pierson fell on the side of the English, his valour being commemorated by paintings and prints, and by a handsome monument in the church of St. Helier. Alderney is a small isle, with a town, and about a 1000 inhabitants in all. Sark has about 300 inhabants [3].

Alderney.

Eddistone.

Returning to the English shore, we first descry Eddistone light-house, beat by all the fury of the western waves. This edifice has repeatedly been overthrown, but the present erection by Mr. Smeaton, composed of vast masses of stone, grooved into the rock, and joined with iron, promises alike to defy accidental fire, and the violence of the ocean, though the waves sometimes wash over the very summit in one sheet of foam.

Scilly.

About thirty miles to the west of the Land's End, appear the Isles of Scilly, which have been idly deemed the Cassiterides of the ancients, though these rocks be too minute to have attracted their notice. This cluster pretends to the name of 145 isles, covered with grass or moss, besides innumerable dreary rocks. The largest isle is that of St. Mary, which is about five miles in circuit, and has a castle and garrison; inhabitants about 600. That of St. Agnes is rather fertile, inhabitants about 300. The whole inhabitants of the Scilly Isles are computed at about 1000. The cattle and horses small; but sheep and rabbits thrive well. Considerable quantities of kelp are prepared amid these rocks [4].

[3] Gough's Camden, iii, 753. [4] Ibid.

On turning to the North, first appears the little isle of Lundy, situated in the Bristol Channel, about three miles long, but not a mile in breadth, with about 500 acres of good land, some rivulets, and a castle. It was formerly a noted retreat for pirates. British Isles. Lundy.

Some small isles lye off the Welch coast of Pembrokeshire and Caernarvon, such as Caldy, Skomar, Bardsey, and others *: but the isle of Anglesea deserves more attention, being the Mona of Tacitus, while the Isle of Man is more properly the Monæda of the ancients. Anglesea is about twenty-five miles in length, and eighteen in breadth. The chief towns are Newburgh, Beaumaris, and, on the western extremity, fronting Ireland, Holyhead This isle is so remarkably fertile, that the Welch have emphatically styled it the mother of Wales; and of late has been also productive of rich copper, found in the Parrys mountain, in the N. E. part of the island, near Amluch, of which an account has been given in treating of the English minerals. This isle also produces green serpentine, with asbestos. Beaumaris is a large town, with a castle built by Edward I. Newburgh is a corporation of smaller moment. Holyhead, originally a fishing town, has become of consequence, by the Irish packets which pass daily, the average time being twelve hours. Anglesea.

The last English isle worth mention, is that of Man; it is about thirty miles in length, and fifteen in its greatest breadth. In the midst is a high mountain, called Snafel. The chief mineral productions are black marble, slate, lime-stone, lead, copper, and iron. Man is also well stored with black cattle, and sheep: and the population has of late years greatly increased. This isle was seized by the Norwegians, along with the Western Isles of Scotland, in the ninth century; and remained under these lords an independent kingdom, till the thirteenth century, when it fell with those islands to Alexander III of Scotland. The Scots were expelled in the reign of Edward II, but the title continued dubious, for in the 15th and 16th centuries, Alexander and John, Dukes of Albany, styled themselves Lords of Man, and interwove the arms in Man.

* Barry, a small isle, S. W. of Cardiff, is lately noted for sulphate of strontian, also found at Old Passage, fourteen miles N. W. of Bristol, and near Mendip hills.

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British Isles.

their heraldry. In the reign of Henry IV, the kingdom of Man was conferred on the Stanleys, afterwards Earls of Derby, and latterly paſſed to the family of Athol by marriage. This petty ſovereignty has been ſince purchaſed and annexed to the Engliſh crown. The chief places are Douglas and Caſtletown, and there are ſome conſiderable villages.

Thanet.

There are alſo ſome ſmall iſlands off the eaſtern coaſt, as Lindisfarn, and Coquette iſland, near the mouth of the river of that name, in Northumberland. The iſle of Thanet is now joined to the land of Kent; but Sheppey remains a pleaſant and intereſting iſle.

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From Gen.l Roy's Map corrected in Positions, and the Surveys of the different Shires.

Published March 1.st 1806. by Cadell and Davies, Strand; and Longman and Rees, Paternoster Row

SCOTLAND.

CHAPTER I.

Names.—Extent.—Original Population.—Progressive Geography.—Historical Epochs.—Antiquities.

SCOTLAND was first discovered to the Romans by Agricola; and the luminous pages of Tacitus disclosed the situation and manners of the country. It is not improbable that the Thule of the Phœnicians may have been the main land of Shetland; or, perhaps, as some think, even the north of Scotland, which the Phœnicians, standing out to sea, and afterwards bending their course towards the land, may have mistaken for another island, a circumstance not unusual in the annals of navigation. However this be, not even a hint that can be positively applied to Scotland, can be found in the ancient writers, till the Flavian family held the Roman sceptre. NAMES.

Tacitus discriminates the northern part of Britain from the southern, by the special and repeated appellation of Caledonia, a name said to be derived from a Cumraig word, signifying woodlands, forests, or, perhaps, rather a mountainous country, for the ancients often blended the ideas of forest and mountain; the Riphæan mountains, for instance, being, in fact, only a vast forest, as no mountains are to be found in that situation and direction.

 The

NAMES.

The names *Caledonia*, and *Caledonians*, continued to be uſed till the Roman power expired. Bede, the father of Engliſh hiſtory, calls the inhabitants of the country, by the name of *Picti*, which had alſo been uſed by the later Roman writers, as ſynonymous with that of *Caledonii*. The country he denominates, in the lax barbaric Latin of that age, *Provincia Pictorum*, the province, or region of the Picti. This new name ſeems to have been native (Piks, or Pehts); and to have originated from a country ſo ſtyled, in the ſouth of Norway, whence this colony had arrived. The Saxon writers, and among them King Alfred, call the people Peohts, and the country Peohtlond.

Theſe diſtinctions continued till the eleventh century, when the new name of Scotia was taken from Ireland, its former object, and applied to modern Scotland. This confuſion ſeems to have originated from the vanity or affectation of the Iriſh clergy, who were eſtabliſhed in Scotland, and were the ſole inſtructors of the people; no native Caledonian ſaint being mentioned in the eccleſiaſtic annals, till the twelfth century, the Picti retaining much of the ignorance and ferocity of their Scandinavian progenitors. Nor can the new term *Scotland*, be properly derived from any pretended conqueſt of the Picti, by the Attacotti, a colony of Scots or Iriſh, who had ſettled in Argyleſhire, as the Saxon and Iriſh authors continued to uſe the former appellations for three centuries after that event is ſaid to have happened.

Extent.

That part of Great Britain, called Scotland, is about 260 miles in length, by about 160 at its greateſt breadth; it extends from the 55th degree of latitude, to more than 58½. The ſuperficial contents have been computed at 27,793 ſquare miles, a little exceeding that of Ireland, and conſiderably more than half that of England. The population being eſtimated at 1,600,000, there will of courſe be only fifty-ſeven inhabitants, for every ſquare mile, a proportion of about one third to that of Ireland. This defect of population ariſes ſolely from the mountainous nature of the country, amounting, perhaps, to one half, little ſuſceptible of cultivation.

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The Scotiſh counties are as follow, the number of inhabitants being eſtimated from the enumeration of 1801: NAMES, &c.

	Counties.	Inhabitants.
Northern Diviſion.	Orkney	46,844
	Caithneſs	22,609
	Sutherland	23,117
	Roſs	52,291
	Cromarty	3,052
	Inverneſs	74,292
Midland Diviſion.	Argyle	71,859
	Bute	11,791
	Nairn	8,252
	Murray, or Elgin	26,705
	Banff	35,807
	Aberdeen	123,082
	Mearns, or Kincardine	26,349
	Angus, or Forfar	99,127
	Perth	126,166
	Fife	93,743
	Kinroſs	6,725
	Clackmannan	10,858
	Stirling	50,825
	Dunbarton	20,710
Southern Diviſion.	Weſt Lothian, or Linlithgow	17,844
	Mid Lothian, or Edinburgh	122,954
	Eaſt Lothian, or Haddington	29,986
	Berwick	30,621
	Renfrew	78,056
	Ayr	84,306
	Wigton	22,918
	Lanark	146,699
	Peebles	8,735
	Selkirk	5,070
	Roxburgh	33,682
	Dumfries	54,597
	Kirkudbright	29,211

NAMES, &c. Original Population.

So far as hiſtorical reſearches can diſcover, the original population of Scotland conſiſted of Cimbri, from the Cimbric Cherſoneſe. About two centuries before the Chriſtian æra, the Cimbri ſeem to have been driven to the ſouth of Scotland by the Caledonians or Picti, a Gothic colony from Norway. The Cimbri, a congenerous people with the Welch, continued to hold the country ſouth of the two firths of Forth and Clyde; but from the former region they were ſoon expelled by the Picti, who, in this corner, became ſubject for a time to the Anglo-Saxon kings of Bernicia. On the weſt, the Cumraig kingdom of Strath Clyde continued till the tenth century, when it became ſubject to the kings of North Britain; who at the ſame time extended their authority, by the permiſſion of the Engliſh monarchs, over the counties of Cumberland and Weſtmoreland, which abounding with hills and fortreſſes on the ſouth and eaſt, were little acceſſible to the Engliſh power; and while the Danes poſſeſſed the country to the north of the Humber, could yield little revenue or ſupport to the Anglo-Saxon monarchs. From the Picti originates the population of the Lowlands of Scotland, the Lowlanders having been in all ages a diſtinct people from thoſe of the weſtern Highlands, though the Iriſh clergy endeavoured to render their language, which was the moſt ſmooth and cultivated of the two, the polite dialogue of the court and ſuperior claſſes. About the year of Chriſt 258, the Dalriads of Bede, the Attacotti of the Roman writers, paſſed from Ireland to Argyleſhire, and became the germ of the Scotiſh Highlanders, who ſpeak the Iriſh or Celtic language, while the Lowlanders have always uſed the Scandinavian, or Gothic.

Progreſſive Geography.

The progreſſive geography of Scotland, is little opulent in materials. In the ſecond century we find a map of North Britain, by Ptolemy; but by ſome ſingular error, it is as inaccurate as his map of Hindoſtan; for he repreſents the Mull of Galloway as the moſt northern promontory of Scotland, and thence bends the country due eaſt, ſo that all his longitudes and latitudes are fictitious.* This ſtriking inſtance evidences that he often accommodated his longitudes and latitudes, from mathematical conjecture, to careleſs ſketches which had been taken by the Roman engineers, or by navigators. But his diſtribution of the tribes

* See the letter of M. Goſſellin to Mr. Pinkerton, in the *Recherches ſur les Scythes*, Paris 1804, 8vo.

which

which then inhabited Scotland, may be regarded as tolerably exact. In the centre of the country he places a vast forest, which he calls the Sylva Caledonia, chiefly extending over modern Perthshire, an indication that the colonies had settled on the shores, and that the interior part of the country was little known. The Otadeni were the people of modern Northumberland and Lothian; the Selgovæ extended over Dumfrieshire, and Kirkudbright, to the bay of Wigton, while the Novantæ filled modern Wigtonshire, and extended upwards to Ayre-bay. The fourth southern tribe was that of the Damnii, who possessed the central region, from near the source of the Clyde, to that of the Erne. On the north-east of the Damnii were the Venicontes, from the Frith of Forth to the river Dee, while the Texali held the modern shires of Aberdeen and Bamf. To the west of them were the Vacomagi, extending from Fort William to the Castra Alata or Invernefs. The other tribes scarcely deserve enumeration: the Cornabii possessed the most northern parts of Scotland, from Dunsby-head to Strathnaver. Four tribes extend along the north-west, down to Loch Linny; to the south of which are placed the Epidii, in Argyleshire, who were divided by Loch Fyn from the Gadeni, who held that part to the east of Argyleshire, called Cowal, in the county of Dumbarton.

NAMES, EXTENT, &c.

After the time of Ptolemy little information arises concerning the geography of Scotland, till, after the lapse of seven or eight centuries, we find the dawn of the present names and divisions. In the latter Roman period, the province of Valentia embraced that part which was south of the Clyde and Forth; as for a short space, from about A. D. 140 to 170, the name of Vespasiana had been imparted to the region extending from the Forth to Loch Nefs. The remains of Roman roads form the chief evidence of the firm possession of the latter province.

In the middle ages, the name of Albany had been applied to that part of Scotland which lies on the north of the Firths; and about the year 1200, was written the *Descriptio Albaniæ*. In the fourteenth century, Fordun produced a larger and more precise idea of Scottish geography. Harding, who wrote his rhyming Chronicle in the reign of Edward IV, gives a tolerably exact description of Scotland, which he had visited; and some manuscripts of his work contain a rude map of the country.

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NAMES, EXTENT, &c.

It muſt be obſerved, that the miſapprehenſions of Ptolemy concerning the due poſition of North Britain, are rectified, even in old Anglo-Saxon drawings. The firſt engraved map is that publiſhed by Biſhop Leſley, with his Hiſtory; but it abounds with portentous errors, which have been ſlowly removed. The Atlas publiſhed in the laſt century, does honour to the induſtry and abilities of Pont, and the munificence of Sir John Scott; and the recent exertions of Dorret, Roy, Mackenzie, Huddard, Ainſlie, and others, have contributed to eſtabliſh ſome exactneſs in the geographical and hydrographical delineation of the country.

Hiſtorical Epochs.

The original population of Scotland by the Cimbri, and by the Picti, forms, as uſual, the firſt hiſtorical epoch.

2. The entrance of Agricola into Scotland, and the ſubſequent conflicts with the Romans, till the latter abandoned Britain.

3. The ſettlement of the Dalriads, or Attacotti, in Argyleſhire, about the year 258, and their repulſion to Ireland about the middle of the fifth century.

4. The commencement of what may be called a regular hiſtory of Scotland, from the reign of Druſt, A. D. 414.

5. The return of the Dalriads, A. D. 503. and the ſubſequent events of Dalriadic ſtory.

6. The introduction of Chriſtianity among the Caledonians, in the reign of Brudi II, A. D. 565.

7. The union of the Picti and Attacotti, under Kenneth, A. D. 843.

8. The reign of Malcolm III, A. D. 1056; from which period greater civilization began to take place, and the hiſtory becomes more authentic.

9. The extinction of the ancient line of kings, in the perſon of Margaret of Norway, grand-daughter of Alexander III, A. D. 1290. This event occaſioned the arbitrary interpoſition of Edward I, king of England, which was the ſole ſource of the enmity which afterwards unhappily prevailed between the kingdoms.

10. The acceſſion of the Houſe of Stuart to the Scotiſh throne; a family which produced moſt ingenious and intelligent, but moſt unfortunate princes.

11. The eſtabliſhment of the Proteſtant religion, A. D. 1560.

12. The

12. The union of the two crowns, by the acceſſion of James VI, to the Engliſh ſceptre, A. D. 1603. Historical Epochs.

13. The civil wars, and the ſubſequent diſputes between the Preſbyterians and Independants; cauſes that extinguiſhed all ſound literature in Scotland, for the ſpace of twenty years, A. D. 1640—1660.

14. The revolution of 1688, and the firm eſtabliſhment of the Preſbyterian ſyſtem.

15. The union of the two kingdoms, in 1707.

16. The abolition of the hereditary juriſdictions, 1755, which laid the firſt foundation of the ſubſequent proſperity in Scotland.

The monuments of antiquity belonging to the more early epochs, may be conſidered in the following order. Of the firſt epoch, no monuments can exiſt, except thoſe of the tumular kind; and it is impoſſible to aſcertain the period of their formation. The remains of the Roman period in North Britain, chiefly appear in the celebrated wall, built in the reign of Antoninus Pius, between the firths of Forth and Clyde, in the ruins of which many curious inſcriptions have been found. Another ſtriking object of this epoch, was a ſmall edifice, vulgarly called Arthur's Oven, which ſeems rightly to have been regarded by ſome antiquaries, as a ſmall temple, dedicated to the God Terminus, probably after the erection of the wall of Antoninus, for we are not to conceive that theſe walls were the abſolute lines, beyond which the Romans poſſeſſed no territory; while, on the contrary, in the pacific intervals, the garriſons along the wall may have claimed the forage of the exterior fields; and the ſtream of Carron, beyond which this chapel ſtood, may have been conſidered as a neceſſary ſupply of water. The remains of the wall and forts, and other Roman antiquities in Scotland, particularly their camps and ſtations, many of which are remarkably entire, are ably illuſtrated in a late publication of General Roy, to which this reference muſt ſuffice, with this ſole remark, that the ingenious author has too implicitly followed a common antiquarian error, in aſcribing all theſe camps, ſtations, &c. to Agricola, while they may be more juſtly aſſigned to Lollius Urbicus, A. D. 140, or to the Emperor Severus, A. D. 207; eſpecially, indeed, to the latter, for the Emperor's appearance in perſon to conduct two campaigns, probably Antiquities.

as

ANTIQUITIES.

as far as Inverness, must have occasioned the erection of works more eminent and durable than usual, the soldiers being excited by the animating controul of a military monarch. Constantius Chlorus also, A. D. 306, made a long progress into Scotland, if we trust the Panegyrists. Nay, in the reign of Domitian, Bolanus, as we learn from Statius the poet, erected several works in Britain, probably in the north; so that it is idle to impute these remains to any one author: but to a judicious eye, the claims of Lollius Urbicus, and of Severus, seem preferable. The most northerly Roman camp yet discovered, is that near the source of the river Ythan, Aberdeenshire; periphery about two English miles. A smaller station has also been observed at Old Meldrum, a few miles to the S. E.

Roman roads have been traced a considerable way in the east of Scotland, as far as the county of Angus, affording some evidence of the existence of the province Vespasiana; but the chief remains are within the wall. A hypocaust was also discovered near Perth, and another near Musselburgh, so that there was, probably, some Roman station near the Scotish capital, but the name of Alaterva is a ridiculous error, arising from an inscription, by some foreign cohort, to obscure goddesses of their own country, styled *Matres Alatervæ*. The smaller remains of Roman antiquity found in Scotland, as coins, utensils, &c. are numerous.

With the fourth epoch may be said to commence the Pikish monuments of antiquity. The tombs it would be difficult to discriminate from those of the first epoch; but as the Caledonian kings, when converted to Christianity, held their chief residence at Inverness, the singular hill in its vicinity, presenting the form of a boat reversed, may, perhaps, be a monument of regal sepulture. The places of judgment among the Gothic nations, or what are now styled Druidic temples, are numerous; and there is a remarkable one in the Isle of Leuis, where, probably, the monarchs resided in the most early times; but this, perhaps, rather belongs to the Norwegian settlement in the ninth century. Some of these monuments are of small circuit, and such are sometimes found at no great distance from each other; as they were not only sometimes erected merely as temples to Odin, Thor, Freyga, and other gothic deities, but

every chief, or lord of a manor, having jurisdiction over many servants and slaves, such small courts became places of necessary awe. HISTORICAL EPOCHS.

The houses seem to have been entirely of wood or turf; but in some spots singular excavations are found rudely lined with stone: these are called *Weems*, and it is likely that they were always adjacent to the wooden residence of some chief, and were intended as depositories of stores, &c. the roofs being too low for comfortable places of refuge. The stations and camps of the natives, are distinguished by their round form, while those of the Romans belong to the square.

Under the next epoch it would be difficult to discover any genuine remains of the Dalriads. The houses, and even churches, were constructed in wattle-work; and the funeral monuments were cairns, or heaps of stones. It is probable that Christianity did not immediately dissolve ancient prejudices, and that even the Attacottic kings were buried in this rude manner, for the genuine chronicles do not affirm that they were conveyed to Hyona, or Icolmkill; and the sepulchres there shewn of Irish and Norwegian kings, must be equally fabulous.

To the sixth epoch may probably belong a chapel or two, still remaining in Scotland, for Bede informs us, that Nethan III, A. D. 715, obtained architects from Ceolfrid, abbot of Jarrow and Weremouth, to build a church in his dominions, probably at Abernethy; but the round tower there remaining, seems of more recent origin. About the year 830, Unguft II founded the church of St. Andrews; and the chapel called that of St. Regulus, (who seems unknown in the Roman calendar,) may, perhaps, claim even this antiquity. It is probable that these sacred edifices in stone were soon followed by the erection of those rude, round piles, without any cement, called Piks houses: yet they may more properly belong to

The seventh epoch, when the Danes may, if they choose, share in the honour of the erection, for such edifices have been traced in Scandinavia. They seem to have consisted of a vast hall, open to the sky in the centre, while the cavities in the wall present incommodious recesses for beds, &c. These buildings are remarkable, as displaying the first elements of the Gothic castle; and the castle of Coningsburg, in

Historical Epochs.

Yorkſhire, forms an eaſy tranſition. The engraved obeliſks, found at Forres, and in other parts of Scotland, have been aſcribed to the Daniſh ravagers, who had not time for ſuch erections. They are, probably, monuments of ſignal events, raiſed by the king or chiefs, and as ſome are found in Scandinavia, as recent as the fifteenth century, it is probable that many of the Scotiſh obeliſks, are far more modern than is generally imagined.*

To enumerate the churches and caſtles, erected ſince the reign of Malcolm III, would be infinite. Some of the moſt ſplendid churches derive their foundation from David I, in the twelfth century.

* The noted vitrified forts ſeem to belong to the thirteenth century. See Enquiry into the Hiſtory of Scotland, 2 vols. 8vo.

CHAPTER II.

Religion. — Ecclesiastical Geography. — Government. — Laws. — Population. — Colonies.

SINCE the revolution, 1688, the Ecclesiastical Government of Scotland is of the Presbyterian form; an establishment attempted in the sixteenth century, but uniformly opposed by the monarchs, as unfavourable to the royal influence. Experience has shewn that the prejudice was unfounded; but violent commotions happened before the Presbyterian triumph became firm. The number of parishes in Scotland is 941[1]; contiguous parishes unite in what is called a Presbytery, of which denomination there are sixty-nine. The provincial synods amounting to fifteen, are composed of several adjacent presbyteries: but the grand ecclesiastical court is the General Assembly, which meets every year, in the spring, the king appointing a commissioner to represent his person, while the members nominate their moderator or president. To this ecclesiastic council laymen are also admitted, under the name of Ruling Elders, and constitute about one-third of this venerable body. This Court discusses and judges all clerical affairs, and admits of no appeal, except to the Parliament of Great Britain. In general the Scotish clergy deserve the highest praise, as men of enlightened minds and moderate conduct; and a singular proof of the diffusion of talents among them, has recently appeared in the Statistical Account of Scotland, published by Sir John Sinclair, in twenty-one volumes; for there are few parishes of which the account is not ably delineated by the clergyman himself; a phœnomenon in the literary world, which will hardly be rivalled by 900 philosophers, or rather theorists of the modern school. RELIGION.

As whatever establishment is effected in a free country, opposition will always arise, the establishment of the Presbyterian system, was, in the space of one generation, followed by the secession. In 1732, about

[1] Statist. Account.

Religion. forty miniſters preſented an addreſs to the general aſſembly, ſpecifying ſeveral defections, which, in their opinion, had taken place, from the original conſtitution of the church, which, in truth, had too much of the rigour of Calvin. Some of the Seceders were deprived of their livings by a committee of the general aſſembly. Perſecution, as uſual, produced followers, and the ſeceders ſoon formed a numerous party. About the year 1747, they were themſelves divided into two denominations, called the Burghers and the Anti-Burghers, becauſe the diviſion aroſe concerning the legality of the oaths taken by the burgeſſes of ſome of the royal boroughs; the former allowing that the oath is proper, while the latter object; the former are the more numerous, the number of their miniſters being computed at about 100, and at a medium each has a congregation of about 1000.

Many reſpectable families in Scotland, embrace the epiſcopal form of the Church of England. The other deſcriptions of religious profeſſions, are not numerous. There are but few Roman catholics, even in the remote Highlands, the ſcheme of education being excellent, and generally ſupported with liberality.

Eccleſiaſtic Geography. To delineate the Eccleſiaſtical Geography of Scotland, would be to enumerate its pariſhes; nor are the preſbyteries and ſynods of ſuch account as to influence the fate of the towns where they aſſemble. The ancient eſtabliſhment comprised two archbiſhoprics, thoſe of St. Andrews and Glaſgow; and eleven biſhoprics (that of Edinburgh having only been eſtabliſhed by Charles I) which, in the order of antiquity, may be thus enumerated; Galloway (St. Andrews) Dunkeld, Moray: five founded by David I, Brechin, Dumblane, Aberdeen, Roſs (Glaſgow); that of Argyle, or Liſmore, was founded about the year 1200, becauſe the biſhops of Dunkeld did not ſpeak the Irish tongue. The biſhops of Orkney, and of the Weſtern Iſlands, date from an early period, while their ſees were not ſubject to the Scotiſh crown.

Government. The Government of Scotland, ſince the union, has been blended with that of England. The chief diſtinction between the original conſtitution of the two countries, was, that Scotland had no houſe of commons, the parliament, conſiſting of all deſcriptions, aſſembled in one hall. That enlightened prince, James I, of Scotland, endeavoured to

eſtabliſh

Government.

eſtabli ſh a houſe of commons, in imitation of that of England, where he was educated; but the people moſt firmly and vigorouſly defended their ſlavery. The moſt ſplendid remaining feature of government in Scotland, is the General Aſſembly. Next to which may be claſſed the high courts of juſtice, eſpecially that ſtyled the Seſſion, conſiſting of a preſident and fourteen ſenators. The Lords of Seſſion, as they are ſtyled in Scotland, upon their promotion to office, aſſume a title, generally from the name of an eſtate, by which they are known and addreſſed, as if peers by creation, while they are only conſtituted lords by ſuperior intereſt or talents. This court is the laſt reſort in ſeveral cauſes, and the only appeal is to the parliament of Great Britain. It is to be regretted, that the cauſes are not determined by jury as in England. The juſticiary court conſiſts of five judges, who are likewiſe lords of ſeſſion, but with a preſident ſtyled the Lord Juſtice Clerk, as he is only underſtood to repreſent the formerly great office of Juſtice General. This is the ſupreme court in criminal cauſes, which are determined by the majority of a jury, and not by the unanimity, as in England. There is alſo a Court of Exchequer, conſiſting of a Lord Chief Baron, and four Barons; and a High Court of Admiralty, in which there is only one judge. The keepers of the great and privy ſeals, and the lord regiſter, or keeper of the records, may alſo be mentioned under this head.

Laws.

The law of Scotland differs eſſentially from that of England, being founded, in a great meaſure, upon the civil law. It partly conſiſts of ſtatute law; but many of the ancient ſtatutes never having been enforced, the chief rule of this ſort ariſes from the deciſions of the ſeſſion, which are carefully preſerved and publiſhed, and afford precedents, generally deemed unexceptionable. Of common law there is hardly a trace, while the civil and canon laws, may be ſaid to form the two pillars of Scotiſh judicature. The modes of procedure have, however, the advantage of being free from many of thoſe legal fictions, which diſgrace the laws of ſome other countries. It may, indeed, be deemed a fiction, that a debtor, who refuſes or neglects to pay, ſhould be proclaimed a rebel to the king, and as it is called, *put to the horn*, before he can be impriſoned. The inferior courts are thoſe of the ſheriffs, magiſtrates, and juſtices of the peace. Under the hereditary juriſdictions, happily

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happily abolished, the peers, and other great men, maintained a power, almost absolute, over their tenants and followers, so that there was no law but the will of the master, and the cities alone could be deemed seats of freedom.

Population.

The most exact account of the population of Scotland, is that given in the Statistical Account[1], from which it appears that the amount, in 1798, was 1,526,492; while, in 1755, it was only 1,265,380; the increase, therefore, is 261,112. The most populous counties are, in the order of numbers, Perth, 133,274; Lanark, 125,254; Aberdeen, 122,921; Mid-Lothian, 122,655; Forfar, 91,001; Fife, 87,250; Argyle, 76,101.

Colonies.

There are no Scotish colonies distinct from those of England; that of Darien, attempted in the reign of William III, was unsuccessful. Nor is this to be regretted, as it is now perfectly understood that the climate is unhealthy, and unfit for any settlement, so that the Spaniards themselves have neglected it.

The army, navy, revenues, political importance and relations of Scotland, are now inseparably intermingled with those of England.

[1] Vol. xx. p. 620.

CHAPTER III.

Manners and Customs.— Language.— Literature.— Education.— Universities.— Cities and Towns.— Edifices.— Inland Navigation.— Manufactures and Commerce.

THE Manners and Customs of the Scots, begin to be much assimilated with those of the English. In their religious ceremonies, attending baptism and marriage, there are variations, arising from the Presbyterian form, which does not admit of godfathers or godmothers, but renders the parents alone answerable for the education of the child. The clergyman does not attend at funerals, nor is there any religious service; but generally great decency. The hearse seems a more appropriated machine than the close waggon so called in England, being a light and lofty carriage of trellice work, painted with black, and spotted with the resemblance of falling tears, an idea derived from the ancient French ceremonies, as may be observed in the collection by Montfaucon. Among the lower classes, the funerals are generally far more numerously attended than in England; nor is black an indispensable colour of dress on such occasions. MANNERS AND CUSTOMS.

In the luxuries of the table, the superior classes rival the English, and the gentlemen are, perhaps, rather more fond of wine. The abundance and beauty of the table-linen are deservedly praised by strangers: several national dishes, formerly served up at the best tables, and originating from the French cooking, in the reign of Mary, are now common or neglected, such as the haggis or *hachis*; cock-a-leekie, or a capon boiled down with leeks; crapped heads, or haddocks stewed, the heads being stuffed with a kind of forced-meat balls, &c. &c. The diet of the lower classes passes in a gradual transition from the north of England. The chief food is *parich*, or thick pottage, formed with oatmeal and water, and eaten with milk, ale, or butter; in a hard lumpy form it is called *brose*. With this the labourer is generally contented twice or thrice

MANNERS AND CUSTOMS.

in the day, with a little bit of meat for Sunday; nor does he repine at the bacon of the Engliſh poor, as it is a food which he commonly loathes, there being an ancient antipathy to swine, as impure animals, into which the dæmons paſſed, as mentioned in the New Teſtament. A ſimilar antipathy prevails againſt eels, as they reſemble a ſerpent, and the old ſerpent. The lower claſſes of Scotland were little given to ebriety, till a ſucceſſion of improvident laws and regulations, reduced the wholeſome malt liquors to mere water, when they were driven to the deſtructive beverage of whiſky; but in general their ſobriety is exemplary; and the Scotiſh manufacturer or labourer, inſtead of waſting his weekly gains at an alehouſe, is ambitious to appear with his family in decent clothes, on Sundays and other holidays. This may be regarded as a ſtriking characteriſtic of the Scotiſh peaſantry, who always prefer the laſting decencies of life, to momentary gratifications. To this praiſe of ſobriety, may be added that of intelligence, ariſing from the diffuſion of education, which is ſuch, that even the miners in the ſouth poſſeſs a circulating library.

The houſes of the opulent have been long erected upon the Engliſh plan, which can hardly be exceeded for interior elegance and convenience. Even the habitations of the poor have been greatly improved within theſe few years, and inſtead of the mud hovel, with ſtraw, there often appears the neat cottage of ſtone, covered with tile or ſlate. Whence the ancient cuſtom aroſe, of placing the dunghill in the front of the houſe, cannot well be imagined; perhaps it was intended in defence, and if ſo, is uſeleſs in pacific times; perhaps it is meant as a diſplay of opulence, in which caſe it is hoped that good ſenſe will extinguiſh ſuch ſuperfluous vanity.

The dreſs of the ſuperior claſſes is the ſame with that of the Engliſh, and only waits the arrival of the faſhions from London, which are conveyed by the mail coaches with great ſpeed. The gentlemen in the Highlands, eſpecially in time of war, uſe the peculiar dreſs of that country. Among the other claſſes, the Scotiſh bonet is now rarely perceived, except in the Highlands; it was the uſual covering for the head all over Europe, till towards the end of the 16th century, when the hat, formerly only worn in riding or hunting, came into general uſe.

The Scotiſh peaſantry are now generally cloathed in good broad cloth, worſted ſtockings, and ſtrong ſhoes, inſtead of the home-ſpun habiliment and nudity of the lower extremities. This laſt ſingularity, common in Wales, and even in England about two centuries ago, is moſtly abandoned even by the Scotiſh laſſes, who may now aſpire to the order of the garter. In the Highlands, it is to be regretted, that a diſtinction of dreſs ſtill prevails, as any variation in dreſs or language only foſters prejudices, and proves the moſt fatal impediment to the progreſs of civilization. Even in theſe enlightened times, if any nation were to return to the ſtate of nudity, a philoſopher could hardly avoid the idea, that they were ſavages; and the maſs of mankind would certainly conſider them as ſuch, for trifles often lead to the moſt ſerious evils. MANNERS AND CUSTOMS.

The amuſements of the rich are on a parallel with thoſe of the Engliſh; but thoſe of the peaſantry have ſeveral diverſities, which the reader may, perhaps, beſt learn from the poems of Burns. That of *curling* conſiſts in rolling large ſtones, with iron handles, upon the ice, towards a fixed mark, a favourite and healthy diverſion in the winter. The Engliſh quoits are ſupplied by *penny-ſtanes*, round flat ſtones, which are toſſed in the ſame manner. Two exquiſite poems of Mr. Burns, his *Halloween*, and his *Cotter's Saturday Night*, will convey more information concerning the amuſements, ſuperſtitions, and manners, of the Scotiſh peaſantry, than the moſt long and animated detail.

The Scotiſh language falls under two diviſions, that of the Lowlands, consiſting of the ancient Scandinavian dialect, blended with the Anglo-Saxon; and that of the Highlands, which is Iriſh. A ſtrict examination of the former, by an unprejudiced enquirer, would evince that it does not originate ſolely from the Anglo-Saxon, as ſome conceive, the mode of ſpelling and pronouncing numerous words, being unknown to the ſouthern idiom: Of this, among other inſtances, may be mentioned the *qu* of the Caledonians, an old Gothic combination, for which Ulphilas invented a letter, and for which the Anglo-Saxons uſed the *w*; as *quhat* for *what*, &c. But this is not the place for ſuch diſcuſſions; and it will be ſufficient to produce the uſual ſpecimen, which, in the moſt ancient language of the Lowlands, would be as follows: Language.

LANGUAGE. Uor fader quhilk beeſt i Hevin. 2. Hallowit weird thyne nam. 3. Cum thyne kingrik. 4. Be dune thyne wull as is i hevin ſva po yerd. 3. Uor dailie breid gif us thilk day. 6. And forleit us uor ſkaths, as we forleit tham quha ſkath us. 7. And leed us na intil temtation. 8. Butan fre us fra evil. Amen.

The iſlands of Orkney were ſeized by the Norwegians, in the ninth century, and the inhabitants retained the Norſe language, till recent times, when they began to ſpeak remarkably pure Engliſh. Chamberlayne has given the Lord's Prayer in their ancient dialect:

Favor ir i chimre. 2. Helleur ir i nam thite. 3. Gilla coſdum thite cumma. 4. Veya thine mota vara gort o yurn ſinna gort i chimrie. 5. Ga vus da on da dalight brow vera. 6. Firgive vus ſinna vora fin vee firgive ſindara mutha vus. 7. Lyve us ye i tuntation. 8. Min delivera vus fro olt ilt. Amen; *or*, On ſa meteth vera.

In the Erſe, or Iriſh, of the Highlands, the ſame ſupplication runs thus:

A n'Athair ata air Neamh. 1. Gu naamhaichear t Tinm. 2. Tigeadh do Rioghachd 3. Deanthar do Thoil air an Tálamh mar a nithear air Neamh. 4. Tabhair dhuinn an diu ar a Aran laitheil. 5. Agus maith dhuinn ar Fiacha amhuil mar mhaithmid d'ar luehd-fia chaibh. 6. Agus na leig am buaireadh ſinn. 7. Ach ſaor ſinn o Ole. Amen.

Literature. The Literature of Scotland recompences for its recent origin, by its rapid progreſs, and extenſive fame. The country that produced Buchanan in the 16th century, could not, in the twelfth, boaſt of one native writer; and only national vanity, or affected ignorance, would claim authors which really belong to other countries. In the 13th century, the native literature firſt begins to dawn; when Scotland, filled with a barbarous Scandinavian colony, muſt not in this reſpect be compared with the ſouthern countries of Ireland and England, but with Scandinavia itſelf, with Holland, and the North of Germany, Poland, Pruſſia, Ruſſia, and Hungary; in all which countries Chriſtianity and literature are comparatively recent.

Yet, it muſt not be forgotten, that in the ſacred ground of Hyona, flouriſhed ſeveral reſpectable Iriſh writers, who are alſo claſſed among the apoſtles of religion and learning in England: Such were Columba, who converted the northern Caledonians, and his biographers, Cuminius and Adomnan, the latter the friend of Bede. Among the Strathclyde Welch, may be named Patrick, in his turn the apoſtle of Ireland.

Independently of these, the most ancient fragment remaining of Scotish literature, is the *Chronicon Pictorum*, written by some Irish clergyman, probably a dignitary of the church of Abernethy, in the beginning of the eleventh century. Of the twelfth century there are some fragments, in the Register of St. Andrew's; and some short Chronicles published by Innes: the Chronicle of Melrose, and that of Holyrood. LITERATURE.

One of the earliest native writers, is Thomas of Erceldon, called the Rimer, who flourished about the year 1270, and wrote a metrical romance, called Sir Tristram, lately published. The next author of note is John Barbour, Archdeacon of Aberdeen, who wrote his poem on the actions of Robert I, in the year 1375, no mean monument of industry and talents for that period. At the same time flourished John Fordun, the father of Scotish history. James I, of Scotland, wrote some excellent poems, early in the fifteenth century; and he was followed by Holland, and Henry the Rimer. In the end of that century arose Dunbar, the chief of the ancient Scotish poets; and, in the beginning of the next, Gawin Douglas, and David Lindsay. The Scotish muse continued to warble till the middle of the seventeenth century, when religious fanaticism extinguished all the arts and sciences, but not before Drummond had woven his web of Doric delicacy. In more modern times, the names of Ramsay, Thomson, Blair, Armstrong, Beattie, Burns, &c. are universally known.

Rude chroniclers continued the chain of events; but History was mute till Buchanan sounded his classical trumpet. Bishops Lesley and Burnet are not without their merit; but why repeat to the echoes of fame, the illustrious names of Hume and Robertson?

The other departments of science are of yet more recent cultivation in Scotland; even theology seems unknown till the beginning of the sixteenth century; and of medicine there is no trace till the seventeenth: while we can now boast of Blair; and Edinburgh ranks among the first medical schools of Europe. Natural philosophy and history were totally neglected till after the Restoration, yet Scotland can now produce able writers in almost every branch, and equal progress has been made in moral philosophy. Among the few departments of literature,

LITERATURE.

in which the Scotiſh authors have been unſucceſsful, may be named epic poetry, comedy, and the critical illuſtration of the claſſics.

Education.

The mode of education purſued in Scotland is highly laudable; and is, perhaps, the beſt practical ſyſtem purſued in any country in Europe. The plan which is followed in the cities, is nearly ſimilar to that of England, either by private teachers, or at large public ſchools, of which that of Edinburgh is the moſt eminent, and may be traced from the ſixtee th century. But the ſuperior advantage of the Scotiſh education conſiſts in every country pariſh, poſſeſſing a ſchoolmaſter, as uniformly as a clergyman: at leaſt, the rule is general, and the exceptions rare. The ſchoolmaſter has a ſmall ſalary, or rather pittance, which enables him to educate the children, at a rate eaſy and convenient, even to indigent parents. It may, indeed, be computed, that a ſhilling will go as far in this parochial education, as a guinea in an Engliſh ſchool. In the Highlands, the poor children will attend to the flocks in the ſummer, and the ſchool in the winter. It is to be wiſhed that the ſalary of that moſt uſeful body of men, the parochial ſchoolmaſters, were moderately augmented, ſo as not to elevate them above their duty, but to ſecure them from want, or from the neceſſity of intermingling other labour with their important and ſalutary office.*

Univerſities.

The univerſities of Scotland, or rather colleges (for an Engliſh univerſity includes many colleges and foundations), amount to no leſs than four; three on the eaſtern coaſt, St. Andrew's, Aberdeen, and Edinburgh; and one on the weſtern, that of Glaſgow. It would have been far preferable to have founded one on the weſtern coaſt of Roſsſhire, in the centre of the Highlands and Iſles, that the light of ſcience might have been diffuſed over theſe neglected regions.

The univerſity of St. Andrew's was founded by Biſhop Wardlaw, in the year 1412; but as it is now of ſmall importance in the proximity of that of Edinburgh, it would be a patriotic meaſure to transfer it to the Highlands as above mentioned. That of Glaſgow was founded by Biſhop Turnbull, in the year 1453, and it has produced many illuſtrious profeſſors and able ſtudents. The late Mr. Anderſon, profeſſor of natural philoſophy, founded an inſtitution to promote the knowledge of natural philoſophy and hiſtory; and more eſpecially the application of

* After this recommendation it has been augmented.

theſe

these sciences, to the useful purposes of commerce and manufactures[3]. It is, indeed, to be wished, that practical utility, and the business of real life, were the chief intentions of a collegiate education. UNIVERSITIES.

The third university, that of Aberdeen, was founded by Bishop Elphinstone, in the year 1500, and it has always supported its high character and intentions. In the year 1593, George Keith, fifth Earl Marshal, founded a college at Aberdeen, being the only Scotish nobleman who can claim that high honour. The last, not least, is that of Edinburgh, founded by James VI, in 1580; and the bare enumeration of its illustrious professors and writers, would occupy too much space for the present plan. The buildings being mean and confined, the foundation of a new edifice was laid in 1789, and, it is hoped, will soon be completed on the magnificent plans adjusted by Adams.

The chief cities and towns in Scotland must now be considered. Edinburgh, the capital, is comparatively of modern name and note. Maitland, and other antiquaries, have fallen into miserable mistakes and misquotations, concerning the origins of this city: a passage of an old writer has been adduced for its existence in 854, while the original is completely silent. Whatever may be the epoch of its existence, the earliest hint that can be applied to it, occurs in the *Chronicon Pictorum*, about the year 955, where mention is made of a town called Eden, as resigned by the English to the Scots, then ruled by Indulf. In the next century, Malcolm III, and Margaret of England, his celebrated queen, are said to have resided in the castle; but her life by Turgot, omits this circumstance, and Holyrood house was the foundation of the first David. But Scotish antiquities have been treated with such inaccuracy, that crude notions are perpetually substituted, instead of that exact knowlege which is to be found in those of other countries. Cities and Towns. Edinburgh.

The population of Edinburgh, including the port of Leith, was, in 1678, computed at 35,500; in 1755, at 70,430; and in 1791, at 84,886[4]. It is probable the present population falls little short of 90,000. The arrivals and clearances at Leith Harbour, exceed the number of 1700 vessels of various descriptions, ships, brigs, and sloops.

[3] Garnett's Tour, ii. 193. [4] Statist. Account, vi. 564.

Of

Cities and Towns.

Of these 165 belong to the town: the commerce has been stated at half a million annually.

The houses in the old town of Edinburgh, are sometimes of remarkable height, not less than thirteen or fourteen floors, a singularity ascribed to the wish of the ancient inhabitants, of being under the protection of the castle. This part of the city stands on the ridge of a hill, gradually descending from the lofty precipice on which the castle is situated, to a bottom, in which stands the palace of Holyrood-house. Adjacent to this edifice, is a park of considerable extent, replete with mountainous scenery; for the basaltic heights of Arthur's seat, and Salisbury crags, are within its precincts. The new town of Edinburgh is deservedly celebrated for regularity and elegance, the houses being all of free-stone, and some of them ornamented with pillars and pilasters. Brick is, indeed, almost unknown in Scotland; and is apt to impress the Scotish traveller with the ideas of slightness, and want of duration. There are several public edifices in Edinburgh, which would do honour to any capital; among such may be named the castle, the palace, the principal church, Heriot's hospital, the register-office, the new college, and several buildings in the new city[5]. There is an elegant bridge, reaching from the hill on which the ancient city stands, to the elevated site of the new town. Another bridge passes in a line with the former, towards the south, over a street called the Cowgate: and an artificial mound extends from the western part of the ridge, to the opposite hill. The environs of Edinburgh are singularly pleasing and picturesque. On the north is an elevated path, leading to the harbour of Leith: on the east are Musleburgh and Dalkeith, rural villages, watered by a beautiful stream. On the south, Pentland-hills; and towards the west, the rivulet Leith, with banks of romantic variety.

Glasgow.

The second city in Scotland is Glasgow, of ancient note, and ecclesiastic story, but of small account in the annals of commerce, till the time of Cromwell's usurpation[6]. The population of Glasgow, in 1755, was computed at 23,546, including the suburbs: the number in 1791, was estimated 61,945. The ancient city was rather venerable than beautiful,

[5] Arnot's Edinburgh. Kincaid's Do. [6] Denholme's Glasgow.

but

but recent improvements have rendered it one of the neateſt cities in the empire. Its weſtern ſituation expoſes it to frequent rains, a diſadvantage recompenſed by its favourable poſition for commerce with America and the Weſt Indies. Its commerce has ariſen to great extent ſince the year 1718, when the firſt ſhip that belonged to Glaſgow croſſed the Atlantic[7]. The number of ſhips belonging to the Clyde, in 1790, was 476, the tonnage 46,581; but, before the American war, it was ſuppoſed to have amounted to 60,000 tons. Though the manufactures ſcarcely exceed half a century in antiquity, they are now numerous and important[8]. That of cotton, in 1791, was computed to employ 15,000 looms; and the goods produced, were ſuppoſed to amount to the yearly value of 1,500,000*l.* the manufactures of linens, woollens, &c. are far from being of ſimilar conſequence. The ancient cathedral of Glaſgow ſurvived the reformation, when the other Scotiſh edifices of that denomination ſunk into ruins. Two convenient bridges are thrown over the Clyde. The environs of Glaſgow preſent little remarkable. Cities and Towns.

Next in eminence are the cities of Perth and Aberdeen, and the town of Dundee. Perth is an ancient town, ſuppoſed to have been the Victoria of the Romans, but the fables concerning Bertha are beneath notice[9]. It is pleaſantly ſituated on the weſtern bank of the river Tay; and has been known in commerce ſince the thirteenth century, but at preſent the trade is chiefly of the coaſting kind, Dundee poſſeſſing a more advantageous ſituation for foreign intercourſe. Linen forms the ſtaple manufacture, to the annual amount of about 160,000*l.* There are alſo manufactures of leather and paper. Perth diſplays few public edifices worth notice. Inhabitants about 28,000. There is a noble bridge, of recent date, over the Tay, and the environs are intereſting, particularly the hill of Kinnoul, which preſents ſingular ſcenes, and many curious mineral productions[10]. Perth.

About eighteen miles nearer the mouth of the Tay, ſtands Dundee, in the county of Angus, a neat modern town. The firth of Tay is here Dundee.

[7] Statiſt. Account, v. 498. [8] Ib. 502. [9] Ib. xviii. 489, &c.
[10] Anderſon's Muſes Threnodic.

between

Cities and Towns.

between two and three miles broad; and there is a good road for shipping to the east of the town, as far as Broughty-castle. On the 1st of September 1651, Dundee was taken by storm by General Monk; and Lumisden, the governor, perished amidst a torrent of bloodshed. The population is, however, now computed at 24,000; the public edifices are neat and commodious. In 1792, the vessels belonging to the port amounted to 116, tonnage 8550. The staple manufacture is linen, to the annual value of about 80,000*l.* canvass, &c. about 40,000*l.* Coloured thread also forms a considerable article, computed at 33,000*l.* and the leather tanned at 14,000*l.*".

Aberdeen.

Aberdeen first rises to notice in the eleventh century, and continued to be chiefly memorable in ecclesiastic story. In the fourteenth century it was destroyed by Edward III, of England. The population in 1795, was computed 24,493. Though the harbour be not remarkably commodious, it can boast a considerable trade, the chief exports being salmon and woollen goods. In 1795, the British ships, entered at the port, were sixty-one, the foreign five; and the British ships cleared outwards, amounted to twenty-eight. The chief manufactures are woollen goods, particularly stockings, the annual export of which is computed at 123,000*l.* The coarse linen manufactures are not of much account; but the thread is of esteemed quality.

The other chief towns of Scotland shall only be briefly mentioned, beginning with the south-east part of the kingdom. Berwick is a fortified town of some note, and carries on a considerable trade in salmon. The vessels built at this port, are constructed on excellent principles.

Berwick.

Jedburgh.

Jedburgh, on the river Jed, which descends from the Cheviot-hills, is chiefly remarkable for the beautiful ruins of an abbey, founded by David I. In the year 1523, it was burnt by the Earl of Surrey, who says that it then contained twice as many houses as Berwick, many of them elegantly built; and it was defended by six strong towers.

Dumfries.

Dumfries stands on a rising ground, on the eastern banks of the Nith, and contains about 6000 inhabitants.

Ayr.

Ayr, the chief town in the S. W. of Scotland, is situated on a sandy plain, on a river of the same name. The chief trade is in grain and

" Statist. Account, viii. p. 204, &c.

coals; and a few veſſels are built. Inhabitants about 7000. Irwin has about 4000. Cities and Towns.

Lanark ſtands in a moſt pictureſque country, near the celebrated falls of the Clyde. It was only noted for its academy, under the management of Mr. Thomſon, brother-in-law of Thompſon the poet, till the recent cotton manufacture, and other erections by the patriotic Mr. Dale, rendered this town ſtill more worthy of attention. Lanark.

Greenock and Port Glaſgow, are conſiderable towns, which have ariſen to celebrity, by ſharing in the trade of Glaſgow. Greenock is ſuppoſed to contain 15,000 inhabitants; Port Glaſgow about 4000. Paiſley, in the ſame county, is celebrated by its manufactures of muſlin, lawns, and gauzes, to the annual amount, it is ſaid, of 660,000*l.* The population amounts to about 20,000. Kilmarnoc has alſo become a conſiderable town. Dunbarton, on the northern ſhore of the Clyde, contains above 2000 ſouls, and is alſo ſubſervient in the manufactures of Glaſgow. Greenock. Paiſley.

Stirling is rather remarkable for its commanding, and truly royal ſituation, than for its induſtry. The inhabitants are computed at 5000. Between Stirling and Edinburgh ſtands Boneſs, formerly called Borrowſtoneſs, in the midſt of colleries and ſalt-works: the harbour is good, and there are about 2600 inhabitants. Stirling.

The county of Fife contains many towns, ſome of which were in a more flouriſhing ſituation, when Scotland carried on a conſiderable intercourſe with France. Dunfermline is a pleaſant town, containing about 5000 inhabitants, and carries on a valuable manufacture of diapers. There are ruins of a palace, the royal reſidence in the time of Malcolm III. St. Andrew's has about 2,500; it is chiefly remarkable for its ruined cathedral. Dunfermline.

Forfar, in Angus, contains about 3400 ſouls, and the linen manufactures deſerve mention.

Dunkeld is of venerable and pictureſque fame, but its linen manufactures are inconſiderable. Brechin contains about 5000 people: its products are linen, cotton, and tanned leather. Montroſe has an equal population, and a few manufactures; the buildings are moſtly modern and neat. Dunkeld.

Cities and Towns.

The county of Mearns prefents no town worth mention. Peterhead, in Aberdeenfhire, contains about 2000 fouls. It has a mineral fpring, and carries on fome trade with the Baltic. Frazerburgh, near the promontory of Kinnaird Head, has alfo a tolerable harbour.

Portfoy.

Portfoy is a fea-port town, peopled with about 2000 fouls. In the neighbourhood, are the rocks well known to mineralogifts, containing elegant granites, of different kinds, ferpentines, and fteatites, with their ufual concomitants, afbeftos and amianthus.

Elgin.

Elgin, the capital of the county of Moray, boafts of the remains of an elegant cathedral, and is fuppofed to contain 4000 inhabitants.

Invernefs.

Invernefs is an ancient and flourifhing town, the capital of the northern Highlands. The population is computed at 10,000. The chief manufactures are ropes and candles. An academy has lately been founded here on an excellent plan.

The few towns further to the north are of little account. Port Rofe has only 800 fouls; but Cromarty has about 3000, a fmall manufacture of coarfe cloth, and fome coafting trade in corn, thread, yarn, nails, fifh, and fkins. Dingwall contains 700 fouls, and a fmall linen manufacture. Tain has about 1000 inhabitants. Dornoch was once the refidence of the bifhops of Caithnefs: population only 500. After a dreary interval Wick occurs, the laft town on the eaftern coaft; the inhabitants, about 1000, chiefly deal in cod and herrings.

Thurfo, on the northern fhore, fronting the Orkneys, has manufactures of woollen and linen. Population about 1600.

Inverary.

Hence there is a lamentable void along the weftern half of Scotland, till we arrive at Inverary, in Argylefhire, the foundation of the noble houfe of Argyle, after paffing a fpace of about 160 miles, where only a few fcattered hamlets can be found *. Inverary is a neat and pleafant town of about 1000 fouls; there are manufactures of linen and woollen, and a confiderable iron-work. The ore is brought from the weft of England, and is fmelted with charcoal from the woods of Argylefhire.

* The fifhing ftations of Tobermory and Steen have declined, becaufe land was given to the fettlers. Lord Selkirk on the Highlands, p. 99.—It is much to be regretted that a city is not founded, for the want of a market is a radical obftacle. Settlers might be allured by exemption from taxes, freedom from arreft for debts, &c.

In the ſame county is Campbeltown, a royal borough, in the ſouthern part of the peninſula of Cantire. The trade is conſiderable, as it is the general reſort of the fiſhing veſſels; and the inhabitants are computed at about 5000. The harbour is excellent, in the form of a creſcent, opening to the eaſt, in front of the iſland of Arran. About fifty weavers are employed in the cotton manufacture [10]. Cities and Towns. Campbeltown.

Scotland abounds with remarkable edifices, ancient and modern. Thoſe of the capital have been already mentioned. In its vicinity is Hopeton-houſe, the ſplendid reſidence of the earl of Hopeton; Dalkeith palace, a ſeat of the duke of Buccleugh; Newbottel, the ſeat of the Marquis of Lothian; Melville caſtle, the elegant villa of the Right Hon. Henry Dundas; and the ſplendid manſion of the Marquis of Abercorn. Nor muſt Pennicuik, the ſeat of the family of Clerk, be omitted; but the traveller of taſte would be more intereſted in Hawthornden, the ancient ſeat of Drummond the poet. It would be vain to attempt a ſimilar enumeration for the other counties, and only a few of the moſt remarkable ſhall be mentioned; ſuch as in the ſouth, the Duke of Roxburgh's, near Kelſo; Mount Teviot, a ſeat of the Marquis of Lothian; Minto tower, Lord Minto's; Lauder caſtle, Marchmont, near Polwarth, both in the Merſ; the Duke of Queenſberry's at Drumlanrig; Lord Douglas's villa at Bothwell; and Hamilton palace, near Hamilton. The county of Ayr contains many beautiful edifices belonging to the nobility and gentry, among which may be mentioned Loudon houſe, the ſeat of the Earls of Loudon; Dundonald that of the Cochrans, Earls of Dundonald, and Colaine caſtle, the ſeat of the Earl of Caſſilis, deſigned by Adams, in 1789. Wigtonſhire has Culhorn, the ſeat of the Earls of Stair, and Caſtle Kennedy; Galloway houſe, Merton, &c. In the vicinity of the flouriſhing city of Glaſgow, it may be imagined that the villas muſt be numerous and elegant; and, even the ſmall iſland of Bute can boaſt of Mount Stuart. The caſtle of Dunbarton is another remarkable edifice in this region. Edifices.

On paſſing the Forth, the rich county of Fife preſents many intereſting edifices, ſuch as Leſlie caſtle, the ſeat of the earls of Rothes; Wemyſs, Kelly, and Balcarras, the ſeat of the earls of thoſe titles; the houſe of

[10] Statiſt. Account, x. 552.

Edifices. Kinrofs, built by Sir William Bruce, &c. &c. Perthfhire contains Tullibardin and Blair, the feats of the Duke of Athol; Dupplin, that of the earl of Kinnoul; Drummond, the refidence of Lord Perth; Taymouth, the fplendid manfion of the Earl of Braidalban; Scone, a royal palace, &c. &c. In Angus we find Panmure, the ancient refidence of the Earls of Panmure; Athie, that of the Earls of Northefk; and Kinnaird, of the Earls of Southefk; Glammis, the venerable feat of the Earls of Strathmore. The fhire of Mearns, or Kincardine, contains Dunotter caftle, the elevated manfion of the Earls Marfhall, &c. Aberdeenfhire prefents Caftle Forbes, Philorth, and Haddo: in Bamfshire we find Cullen houfe, the interefting feat of the Earl of Finlater; Duff houfe, that of the Earl of Fife; Gordon caftle, a beautiful manfion of the Duke of Gordon; in the county of Moray, Tarnaway caftle, the feat of the Earl of Moray; Invernefs prefents Fort Geofge, a military erection of fome note, about twelve miles to the eaft of Invernefs. The line of forts is continued through the centre of the county, by Fort Anguftus, at the further end of Loch Nefs, and Fort William, at the northern extremity of Loch Linny, at the bottom of the lofty Bennevis. In the county of Rofs, on the north of Dingwall, is Caftle Leod, a feat of the Earls of Cromarty: New Tarbet, and Balnagowan, command the Firth of Cromarty. At Dornock and Dunrobin, are feats of the Earls of Sutherland. The fhore of Caithnefs difplays many ancient caftles, but the modern edifices are few: the patriotic Sir John Sinclair has a pleafing refidence near Thurfo; and in the N. W. extremity of Scotland, Lord Reay has two manfions, one near Tong, and another at Durnefs, with an extenfive wild of rocks, interfperfed with moraffes, called Lord Reay's foreft. The weftern coafts of Scotland prefent an enormous void, till Inverary, the fplendid manfion of the Dukes of Argyle, rifes like fome oriental vifion in the wildernefs.

Inland Navigation. The moft remarkable inland navigation in Scotland, is the excellent and extenfive canal from the Forth to the Clyde. Mr. Smeaton's firft furvey was prefented in 1764; but four years elapfed before the act of parliament was paffed for its execution, and the canal was begun in the fame year with the act [1].

[1] Phillips, 276.

"The

INLAND NAVIGATION.

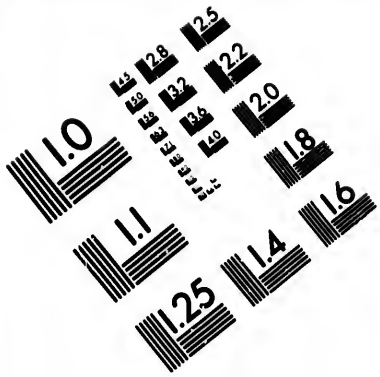
"The dimensions of this canal, though greatly contracted from the original design, are much superior to any work of the same nature in South Britain"[11]. The English canals are generally from three to five feet deep, and from twenty to forty feet wide, and the lock gates from ten to twelve feet; but they answer the purpose of inland carriage from one town to another, for which alone they were designed. The depth of the canal between the Forth and Clyde, is seven feet; its breadth at the surface fifty-six feet; the locks are seventy-five feet long, and their gates twenty feet wide. It is raised from the Carron by twenty locks, in a tract of ten miles, to the amazing height of 155 feet above the medium full sea-mark. At the twentieth lock begins the canal of partition on the summit, between the East and West Seas; which canal of partition continues eighteen miles, on a level, terminating at Hamilton-hill, a mile N. W. of the Clyde, at Glasgow. In some places the canal is carried through mossy ground, and in others through solid rock. In the fourth mile of the canal there are ten locks, and a fine aqueduct bridge, which crosses the great road leading from Edinburgh to Glasgow. The expence of this mile amounted to 18,000*l.* At Kirkintulloch, the canal is carried over the water of Logie, on an aqueduct bridge, the arch of which is ninety feet broad, and was built at three different operations, of thirty feet each, having only one centre of thirty feet broad, which was shifted on small rollers, from one stretch to another. Though this was a new thing, and never attempted before with an arch of this size, yet the joinings are as fairly equal as any other part of the arch. The whole is thought to be a capital piece of masonry. There are in the whole eighteen draw bridges, and fifteen aqueduct bridges, of considerable size, besides small ones and tunnels."

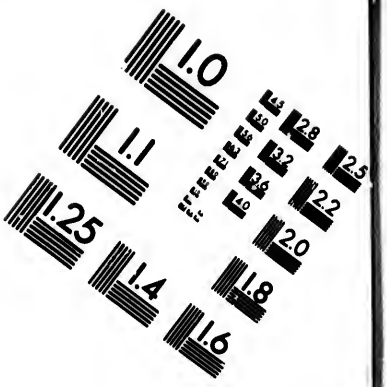
The supplying the canal with water, was of itself a very great work. One reservoir is above twenty-four feet deep, and covers a surface of fifty acres, near Kilsyth. Another, about seven miles north of Glasgow, consists of seventy acres, and is banked up at the sluice, twenty-two feet.

The distance between the firths of Clyde and Forth, by the nearest passage, that of the Pentland Frith, is 600 miles, by this canal scarcely

[11] Phillips, 316.

100.





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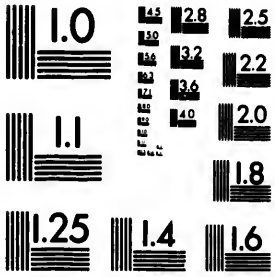

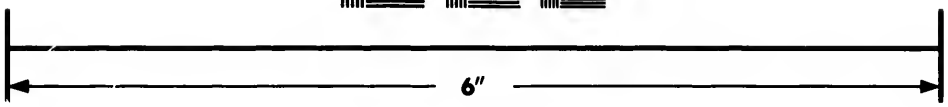

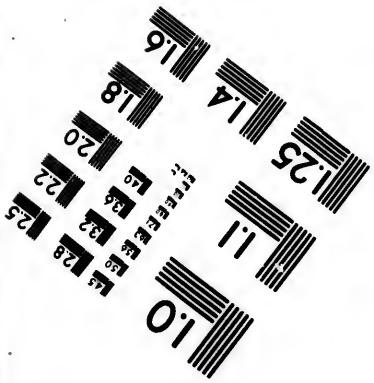

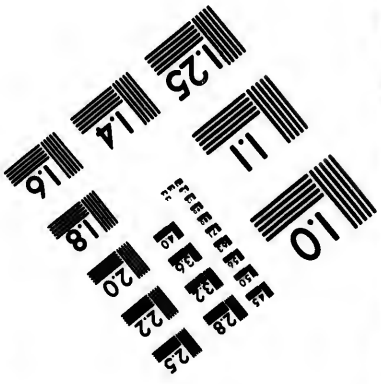

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INLAND NAVIGATION.

100. On the 28th of July, 1790, the canal was completely open from ſea to ſea, when a hogſhead of the water of Forth was poured into the Clyde, as a ſymbol of their junction. The length of the canal is preciſely thirty-five miles, and no work of the kind can be more ably finiſhed.

Another laudable plan was to conduct a canal from Fort William to Inverneſs, than which nothing could contribute more to improve the Highlands. The ſpace to be cut would not be conſiderable, but the times are unfavourable to ſuch a deſign *. The canal of Crinan, which will ſave a troubleſome navigation around Cantire, is actually begun, and is hoped will ſpeedily be completed, when veſſels could paſs at once from the Clyde to the north of Jura. Could a canal be opened from the Firth of Dornoch, and Loch Shin, into the bay of Calval, in Aſſynt, perhaps every thing of this kind would be accompliſhed, that can be executed in the Highlands.

Manufactures and Commerce.

The general commerce of Scotland, though on a ſmaller ſcale, and with ſmaller capitals, is in moſt reſpects ſimilar to that of England, and ſhares in the national proſperity. That of the capital, through Leith, its port, has been eſtimated, as we have ſeen, at half a million yearly †. The chief exports are linen, grain, iron, glaſs, lead, woollen ſtuffs, ſoap, &c. &c. The imports are wines, brandy; and from the Weſt Indies and America, rum, ſugar, rice, indigo. Glaſgow exports cottons of all kinds, muſlins, lawns, gauzes, &c. glaſs, ſtockings, earthenware, cordage, &c. candles, ſoap, iron, leather, &c. &c. The chief imports are tobacco, ſugar, rum, and cotton from the Weſt Indies; Iriſh beef, butter, and linen; wines from Portugal, and other countries. The fiſheries of Scotland, if carried to a proper extent, would furniſh a very conſiderable ſtore of merchandize.

The chief manufactures of Scotland are linen of various kinds, to the amount, it is ſaid, of about 750,000*l.* annually. Of woollens, the

* This canal has actually been begun, and upon a plan which does honour to the ſpirit of the times, being ſuch as to bear frigates of twenty cannons, or ſhips of thirteen hundred tons. The Houſe of Commons has voted fifty thouſand pounds, but it is ſuppoſed that the expence will be four hundred thouſand.

† In 1793, the Scotiſh exports were computed at 1,024,742*l.* Chalmers's Eſtimate, p. lxxv. edit. 1794. The ſhips employed were 2,234. Ib.

Scotiſh

Scotiſh carpets ſeem to form the chief branch. The iron manufactures, particularly that at Carron, deſerve alſo to be enumerated among the chief national advantages. MANUFACTURES AND COMMERCE.

As the neceſſary progreſs of manufactures and commerce, is from the ſouth to the north, owing, among other cauſes, to this, that the prices of food and labour are ſmaller in the north than in the ſouth, it is to be expected, and indeed wiſhed, for the general benefit of the Britiſh empire, that the trade which has paſſed from Briſtol to Liverpool and Glaſgow, may gradually enliven and invigorate, even the Weſtern Highlands and iſlands of Scotland. Some few of the gentlemen in the Highlands, ſeem to object to the propagation of induſtry, as tending to deprive them of their ancient reſpect, and the reminiſcence of feudal power; but this infatuation cannot continue, as it muſt ſoon be perceived, that to diffuſe a ſpirit of induſtry among their tenants, is the only infallible mode of increaſing their own revenues.

CHAPTER IV.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of Scotland is such as might be expected in a latitude so remote, and a country so mountainous. In the eastern parts, there is not so much humidity as in England, as the mountains on the west arrest the vapours from the Atlantic. On the other hand, the western countries are deluged with rain, an additional obstacle to the progress of agriculture; indeed, the chief obstacle, for the example of the Swiss evinces, that industry can overcome even mountains; but the climate of Swisserland is dry and pleasant, and no toil can guard against the excess of falling moisture. Even the winter is more distinguishable by the abundance of snow, than by the intensity of the frost; but in summer the heat of the sun is reflected with great power in the narrow vales between the mountains, so as sometimes to occasion a phænomenon of glittering particles, that seem to swim before the eye. These observations chiefly apply to the north and west. In the east and south the climate differs but little from that of Yorkshire; and corn sometimes ripens in the vales of Moray, as early as in Lothian.

Face of the Country.

The face of the country is in general mountainous, to the extent, perhaps, of two thirds; whence the population is of necessity slender, in comparison with the admeasurement. But the name of Highlands is more strictly confined to Argyleshire, the west of Perthshire, and of Inverness; and the entire counties of Ross, Sutherland, and Caithness. In proceeding from the south east, the entrance into the Highlands near Dunkeld, is very impressive, there being a considerable tract of plain, just before what may be termed the gates of the mountains. Even the eastern parts have little of uniform flatness, but are sweetly diversified with hill and dale. What in England is called a hill, would often in

Scotland be regarded as a mere ſlight riſe in the road. The rivers in general are remarkably pure and tranſparent, and their courſe rapid. The rich roughneſs of an Engliſh proſpect, diverſified with an abundance of wood, even in the hedge-rows, is in Scotland rarely viſible; whence the nudity of the country makes a ſtrong impreſſion on the ſtranger. But the laudable exertions of many of the nobility and gentry, who plant trees by millions, will ſoon remove this reproach. The maritime gales are noxious to ſuch plantations, but it has been recently diſcovered in France, that there is a common tree (the name is unfortunately forgotten) which will remain unhurt, even on the beach; and if a thick ſkreen be firſt formed of this tree, and ſuffered to attain ſome maturity, other denominations will proſper under its protection[1]. Face of the Country.

For a minute account of the various ſoils that prevail in Scotland, and the different modes of agriculture, the reader muſt be referred to the Statiſtical Accounts, publiſhed by Sir John Sinclair. The excellence of the Engliſh agriculture, has juſtly entitled it to an imitation, almoſt univerſal. But this advantage is of recent date; and, for a long period of time, Scotland was remarkable for producing the beſt gardeners, and the worſt farmers in Europe. The ſuperior advantages of great, or of ſmall farms, have been recently diſcuſſed with much care, as the importance of the ſubject demands. It would ſeem, that for the firſt great improvement of a country, the farms ſhould be large, that the farmer may have a ſufficient capital to make experiments, and diſcover the moſt productive crops, or thoſe moſt ſuited to the nature of the ſoil. When laſting examples have thus been inſtituted, it is certainly more advantageous for the community, that the farm ſhould be reſtricted to a ſmall or moderate ſize. Soil and Agriculture.

The three chief rivers of Scotland, are the Forth, the Clyde, and the Tay. The chief ſource of the Forth is from Ben Lomond, or rather from the two lakes, Con and Ard: the ſtream of Goudie ſoon joins it from the lake of Mentieth; and the river Teith, fed by the lakes Ketterin, Lubnaig, and others, ſwells the Forth to a noble ſtream, about four miles above Stirling. Rivers. Forth.

[1] Another uſeful plan is to ſow or plant the ſeeds and trees very thick, or to ſow them with heath, as in Mecklenburg. The ſycamore will bear the ſea-ſpray.

Rivers. The Clyde is ſaid to iſſue from a hill in the S. E. corner of Tweeddale, called Arrik Stane, which is undoubtedly the chief ſource of the Tweed, and one ſource of the Annan: but the Clyde has a more remote ſource in Kirſhop, or Dair water, riſing about ſix miles further to the ſouth, in the very extremity of Lanarkſhire; and the true ſource of the Annan ſeems to be Loch Skeen, in the county of Selkirk. However this be, the Clyde paſſes through Crauford Moor, leaving the range of Leadhills on the left, and winding under the lofty hill of Tinto, near Symington, purſues a northerly courſe, till about two miles to the ſouth of Carnwath, when it aſſumes its chief weſterly direction.

Tay. The principal ſource of the Tay, is the lake of the ſame name, or the river may be traced to the more weſterly ſources of the Attrick and the Dochart, and the ſmaller ſtream of Lochy; which fall into the weſtern extremity of Loch Tay. Soon after this noble river iſſues from the lake, it is joined by the river Lyon; and, at no great interval, by the united ſtreams of the Tarf, the Garry, and the Tumel, the laſt a rapid and romantic river. The ſtreams of Ericht and Ilay, ſwell the Tay, about nine miles to the north of Perth; after paſſing which city, it receives the venerable ſtream of the Ern, and ſpreads into a wide eſtuary.

Tweed. Next in conſequence and in fame, is the Tweed, a beautiful and paſtoral ſtream, which, receiving the Teviot from the ſouth, near Kelſo, falls into the ſea at Berwick.

The Scotiſh Tyne is an inconſiderable river, which runs by Haddington.

Annan. In the ſouth weſt, the Annan contributes largely to the Frith of Solway, but no town worth mentioning adorns its banks. Dumfries ſtands upon the Nith, a river of longer courſe than the Annan, and marked at its eſtuary by the ruins of Carlaveroc caſtle, an important fortreſs in ancient times. The river Ore, and that recently ſtyled Kirkudbright, anciently and properly called the Ken, (whence is derived the title of Kenmure,) and the Fleet, are ſurpaſſed by the river Cree, or Crief; which formerly ſplit Galloway into two diviſions, and which opens into the noted bay of Wigton.

Nith.

The

The rivers of Ayrſhire, flowing into the grand eſtuary of the Clyde, are of inconſiderable ſize. Rivers.

To the north of the eſtuary of Forth, occurs the Eden, which, after watering the royal park of Falkland, and Coupar, the county town, meets the ocean, about two miles to the north of St. Andrews. Eden.

To the north of Tay are the South Eſk, which paſſes by Brechin and Montroſe; and the North Eſk, a leſs conſiderable ſtream, but both impart titles to Earls.

In the county of Kincardine there is no river of conſequence. But the Dee is a conſiderable and placid ſtream, iſſuing from the mountains of Scairſoch, and purſuing a due eaſterly courſe to Aberdeen. The Don runs almoſt parallel, a few miles to the north, joining the ſea about two miles from Aberdeen, after paſſing Old Aberdeen, or rather, in the old orthography, Aberdon. Dee.

A few miles to the north of the Don, the river Ythan falls into the German ocean, a ſtream formerly celebrated for its pearl fiſheries, of which ſome relics remain. The Uggie is the laſt ſtream of any conſequence in Aberdeenſhire.

The following rivers direct their courſe to the north. The Devon joins the ſea at Banf. The Spey is a grand and impetuous river, riſing from a ſmall lake, called Loch Spey, in the vicinity of the high mountain of Corriarok, near Fort Auguſtus, whence it rolls to the ſouth-eaſt, amid mountainous wilds, till it ſuddenly turns to its fixed direction, the north-eaſt, being, perhaps, upon the whole, the moſt conſiderable Alpine river in Scotland. Spey.

The water of Loſſie is only remarkable, as it waſhes the venerable remains of Elgin; but Findorn, which runs by the Forres of Macbeth and Shakeſpeare, is a conſiderable torrent.

The Neſs, iſſuing from the lake ſo called, and the Beuly, conſpire to form the large eſtuary, called Murray Firth; while that of Cromarty is formed by the Grady, the Conon, and other ſtreams. Neſs.

The eſtuary of Dornoch is formed by a river which iſſues from Loch Shin, by the Caran, and by the intermediate ſtream, called Okel.

The other ſtreams in the furtheſt north of Scotland, are unhappily of ſmall conſequence. The water of Thurſo, and that of Naver, are the

Rivers. chief. In the north-weſt extremity are the Strathmore, the Strathbeg, and the Durneſs, which enters the ſea to the eaſt of the ſtupendous promontory of Cape Wharf, now modernized Wrath.

Weſtern Inlets. On the weſt of Scotland there is no river of any moment; but the defect is compenſated by numerous lakes, or rather creeks, of which the moſt conſiderable are Laxford, Calva, Ennard, and that of Broome, which forms a noble bay, ſtudded with iſlands, nearly parallel with the bay of Dornoch. On its ſhore is the projected ſettlement of Ullapool, to which every patriot muſt wiſh ſucceſs *. Next are the En and the Gare, the Torridon, the Keſſern, and others of ſmaller note. Argyleſhire exhibits the Sunart, a long inlet, which terminates at Strontian; and the Linny, extending to Fort William. The Etif is impeded by a ſingular cataract, at its entrance into the ſea. The ſmall inlet of Crinan attracts obſervation, by the promiſed canal; and the liſt is cloſed by Loch Fyne, and Loch Long, forming vaſt inlets from the eſtuary of Clyde.

Lakes. Among the lakes of Scotland, the chief in extent and beauty is that of Lomond, ſtudded with romantic iſlands, and adorned with ſhores of the greateſt diverſity. The iſles are ſuppoſed to form part of the Grampian chain, which here terminates on the weſt. The depth of this lake in the ſouth, is not above twenty fathoms; but the northern creek, near the bottom of Ben Lomond, is from ſixty to eighty fathoms. At the time of the earthquake in Liſbon, 1755, the waters were agitated in a ſingular manner.

Lomond.

Ketterin, &c. On the eaſt of Lomond is an aſſemblage of curious lakes, the Ketterin, or Cathein, the Con, or Chroin, the Ard, the Achray, or Achvary, the Vanachor, the Lubnaig; exhibiting ſingular and picturesque ſcenes, called by the Highlanders the *Troſachs*, a word ſignifying rough, or uneven grounds *. This denomination is ſtrictly applicable to the ſurrounding hills, and rocks, of diſtorted forms, as if ſome convulſion had taken place; but often covered with heath, and ornamented, even to the ſummits, with the weeping birch. The hills are of argillaceous

* Loch Broom extends about twelve miles into the country, and is ſurrounded with mountains of marble and lime ſtone. Knox, ii. 463.

* Garnett's Tour, ii. 173.

ſchiſtus; in other words, in ſtrata of coarſe ſlate, moſtly vertical, and interſperſed with veins of quartz. Ketterin, or Cathein, is a lake of conſiderable extent and beauty, with ſome rocky iſles, and crowned by the mountain of Ben Veney: the fiſh are trout and char. Vanachor has ſalmon and trout; but Achray only pike, tyrants without ſubjects. The Con, the Ard, and Lubnaig, have not been celebrated by touriſts. Lakes.

In the vicinity is the lake of Menteith, a beautiful ſmall lake, about five miles in circumference, with two woody iſles, one preſenting the ruins of a monaſtery, the other thoſe of a caſtle of the old Earls of Menteith. Mentieth.

Having thus briefly deſcribed the principal lake, and ſome others in its vicinity, it may be proper to obſerve, before proceeding to others in a more northerly ſituation, that the S. W. region of Scotland, anciently called Galloway, contains ſeveral picturesque lakes, (which, in Great Britain and Ireland, ſeem always to accompany groupes of mountains,) though not of equal extent and celebrity with thoſe of the north. The moſt conſiderable is the lake of Ken, in the county of Kirkudbright, on which ſtands a village, called New Galloway. This lake is decorated with three ſmall iſles. Next is that of Crey, on the borders of Wigtonſhire. In the county of Ayr there is a ſmall lake, called Loch Dolen.

Returning towards the north, Loch Leven, in Fifeſhire, attracts obſervation from its hiſtorical fame. The lakes in the ſouth of Perthſhire, have been already mentioned, and to the eaſt muſt be added Loch Ern, Loch Tay, and thoſe of Rannoch, Lydoch, and Ericht. That of Tay, in particular, is a grand and beautiful expanſe of water, of ſuch length, as rather to reſemble a noble river; and at its eaſtern extremity, are placed the capital manſion and plantations of the Earl of Breadalbin. Thoſe more to the north of this county, may preſent many yet unſeen and unknown beauties.

Loch Neſs rivals Loch Tay in extent and reputation. This lake was also affected at the time of the earthquake at Liſbon. The depth is from ſixty to 135 fathoms: the fiſh, excellent trout[1]. Its great depth is the cauſe why it never freezes. It is remarkable that the bed of this Loch Neſs.

[1] Pennant's Tour.

lake,

Lakes. lake, and in general of the watery chain which extends to Loch Linney, is filled with farcilite, or pudding-ſtone, hills of which occur near Dunolla and and Dunſtaffnage, on the weſtern ſhores of Argyle. The counties of Sutherland and Caithneſs, contain many ſmall lakes.

Loch Loil. The chief are Loch Loil, which ſends a ſtream into the bay of Far; and Loch Shin, a conſiderable lake, in a country little known or viſited. According to the deſcription of Mr. Cordiner *, it is a charming piece of water, of great extent, winding among the hills, with woods, often ſtretching down to the ſhores. It is ſaid to be twenty miles in length, but the eye can only command a few miles at a time. From its ſouth-eaſt extremity iſſues the river Shin, in two broad caſcades, from the ſides of a ſmall iſland. Mr. Cordiner adds, that by a ſingular error in Dorret's map, the diſtance from Larg church, on the S. E. of Loch Shin, to Moaſdale, ſouth of Loch Naver, meaſures only five miles, while by computation in travelling, there are at leaſt eighteen. But Dorret's map, though valuable for the time, is ſtained with numerous and groſs errors; and Loch Naver lies almoſt due north of Shin, inſtead of due eaſt.

Many of the lakes in the weſtern diviſion of Scotland, have been already mentioned under their proper deſcription, as creeks or bays. Among a few others which deſerve notice, may be named Loch Fainiſh, a conſiderable lake in Roſsſhire; the lakes Lochy and Laggen, in the county of Inverneſs. Loch Awe, in Argyleſhire, is the moſt conſiderable lake in the weſt of the Highlands; it is about thirty miles in length, and from one to two in breadth; and is ſtudded with many ſmall, woody iſles, one of which bears the ruins of a monaſtery, and another thoſe of an ancient fortreſs, the reſidence of the Campbells of Lochawe, afterwards Dukes of Argyle. This lake empties itſelf, by a conſiderable ſtream, near its northern end, into the creek, called Loch Etif.

Mountains. But the chief diſtinctive feature of Scotland, conſiſts in its numerous mountains, which interſect the country in various directions. In the ſouth-weſt, the ancient province of Galloway preſents an extenſive aſſemblage of hills, which ſeldom deſcribe any uniform chain, from the bay of Glenluce, which extends towards Loch Ryan, and thence, in a

* Letters to Mr. Pennant, London, 1780, Quarto, p. 117.

N. E.

N. E. direction to Loch Doon, the ſource of the river Doon, which joins the ſea near Ayr. Other ridges run in various directions, generally north and ſouth, according to the courſe of the rivers, till we arrive at the Nith, near which is Cruffel, a detached ſummit, of conſiderable height. According to General Roy, than whom there cannot be a better authority, the mountains of Galloway form a connected chain with thoſe of Cheviot, on the N. E. Mountains.

But the chief elevation of this part of Scotland, is that metalliferous ridge in its very centre, called the Lead Hills, &c. whence many rivers deſcend in all directions to the ſea. The ſmall ſtream of Elvan conveys particles of gold to the Clyde, and German miners are ſaid to have diſcovered conſiderable quantities of that precious metal. The chief ſummit of that ridge is Hartfell, which, according to ſome accounts, is 3300 feet above the level of the ſea; but by others 2582. Cruffel is only 2044. Not far to the north is Tinto, a remarkable ſolitary mountain; and Queenſberry-hill is about the ſame elevation. Loudon-hill, in Ayrſhire, is little memorable; but on returning to the eaſt, we find the uniform ridge of Lamermoor, terminating in St. Abb's-head. The hills of Pentland, on the ſouth of Edinburgh, are rather pictureſque than important. Berwick Law, and the romantic ſummits in the vicinity of Edinburgh, cloſe the liſt of the ſouthern hills. The Lead hills chiefly conſiſt of argillaceous ſchiſtus; but the grey granite abounds in the mountains of Galloway. In all, however, the chief portion ſeems to be calcareous; the ſummits are round, ſome verdant, others covered with heath. The red granite, and other grand Alpine rocks ſeem here unknown *. In the Lothians, the calcareous ſtrata ſupport vaſt maſſes of whin, trap, and baſalt, which extend to the northern ſhore of the firth of Forth. On the eaſt and weſt of Inverkeithing, are whin and columnar baſalt[1]; the latter alſo occurring at Dichmont-hill, near Rutherglen, in Lanarkſhire, and at Dunbarton.

On paſſing the Forth, appears the range of Ochill-hills, more remarkable for their ſingular agates and calcedonies, than for their height; Ochill.

* Cruffel is however red granite; as is the incloſure wall of the adjacent abbey of Sweet Heart. Mr. Cadell's MS. Notes.

[1] Mr. Aikin's MS. Notes.

and

Mountains. and to finish the account of the Lowland hills, must be added those of Kinnoul and Dunsinnan, in the east of Perthshire, and a small range in Angus. In the county of Kincardin, the great chain of the Grampians terminates. On the north-east of Aberdeenshire, is Mormond, a remarkable solitary summit; from whence no mountains of note occur till Inverness, on the west, opens the path to the Highlands. Yet, it must not be forgotten, that from the lofty promontory of Trouphead, to Portsoy, extend vast masses of beautiful red granite, interspersed with schorl; and of serpentine with steatites, and other valuable stones. The cape called Kinnaird-head, near Frazerburgh, presents curious micaceous schistus; but the eastern shore offers nothing worthy of remark. Before leaving the Lowland hills, it may be observed that the small ridge in Fifeshire, between the Eden and Leven, called Loman-hills, consists mostly of hard free-stone, with superincumbent strata of whin and basalt: while that separating the plain of Kinross from Strathern, is on the south side whin, and on the north toad stone, with calcareous spar, and steatites. Soon after occur the Alpine rocks of siliceous and micaceous schistus[6]. In general, the observation of Saussure is applicable, that mountains gradually rise from the calcareous to the micaceous, and thence to the granite.

Grampian Hills. The Grampian hills may be considered as a grand frontier chain, extending from Loch Lomond to Stonehaven, and forming the southern boundary of the Highlands, though four or five counties on the north-east of that chain, have, in their eastern and northern parts, the name and advantage of Lowlands. The transition to the Grampians is gradual, the first chain, according to General Roy, consisting of the Sadley-hills on the east, the Ochills in the middle, and Campsy-hills on the west. To the Grampian chain belongs Ben Lomond (3262); Ben Ledy (3009); Ben More (3903); Ben Lawres, the chief summit (4015); Shihallion (3564); Ben Verlich (3300); and other less important elevations on the east. Mount Battock in Kincardinshire, is 3465 feet. Ben Cruachan, in Argyleshire, is a solitary mountain, of 3300 feet above the sea.

[6] Aikin's Notes.

Ben

Ben Nevis is the highest mountain in Great Britain, being estimated at 4350 feet above the level of the sea, not much above a quarter of the height of Mont Blanc. This mountain has not hitherto been explored by any mineralogist. On the N. E. side it presents a precipice, nearly perpendicular, and of prodigious height, by some accounts 1500 feet. The view from the summit is grand [7], exhibiting most of the western Highlands, from the paps of Jura, to the hills of Cullen in Skey; on the east it extends to Ben Lawres, in Perthshire, and the river Ness; extent of view about eighty miles. The superior half of the mountain is almost destitute of vegetation. The summit is flat, with a gentle acclivity, and forms an easy pavement, probably of granite. Snow remains in the crevices throughout the year; but here are no glaciers, nor other magnificent alpine features *. Mountains. Ben Nevis.

It would be difficult to divide the remaining mountains of the Highlands into distinct lines or groupes: they shall, therefore, be briefly mentioned in the order of proximity. To the N. W. of Ben Nevis is the long mountain of Corriarok, near Fort Augustus, over which a military road has been directed, in a zig-zag direction. From the foot of this mountain arises the rapid river Spey; and other streams run to the west, circumstances which indicate great elevation. About thirty miles to the east, rises the mountain Cairngorm (4060 feet), or the blue mountain, clothed with almost perpetual snow, and remarkable for quartz of different colours, chiefly the smoaky kind, well known to lapidaries. The other chief mountains in this region, are those of Braemar, or Scairsoch, at the source of the Dee; Ben Awn, and many of smaller height, such as Benibourd †, Benachie, &c. Corriarok. Cairngorm.

In the second division of the Highlands, which lies beyond Loch Linny and Loch Ness, the mountains are yet more numerous, but not so memorable. The western shore, in particular, is crowded with hills, from the island of Skey to cape Wrath, while a branch, spreading east-

[7] Statist. Acc. viii. 414.

* Drumalban, the *Dorsum Britanniæ* of the old writers, seems to be Ben Nevis, with the high desert Moor of Rannoch, extending twenty miles to the east of that mountain.

† Always covered with snow, and, perhaps, as Mr. Aikin conceives, higher than Cairngorm. About the height of 4200 feet, snow remains all the year in Scotland.

Mountains. ward towards Ord-head (1250 feet) forms, what are termed by ſeamen, the Paps of Caithneſs (1929 feet). The chief mountains on the weſt of Roſsſhire, are Ben Chat, Ben Chaſker, Ben Golich, on the ſouth of Loch Broom; Ben Nore, on the north of that commodious haven; and the hills of Cuinak, on the ſouth of Calva bay, or in the native language Kylis-Cuin. More inland, are Ben Foſkaig; and the chief mountain in this diſtrict, Ben Wevis (3720 feet).

On proceeding to the moſt northern parts of Scotland, the counties of Sutherland and Caithneſs, firſt occurs Ben Ormoid; then Ben Cliberg, on the weſt of Loch Naver; and Ben Grim, to the north of which extends the chain, called the Paps, conſiſting of the mountains Morben, Scuraben, &c. from which run in a northerly direction, according to the courſe of the rivers, inferior chains, as that of Ben Maddy, on the eaſt of the river Naver, &c. The N. W. extremity of Scotland preſents ſome pleaſant vales toward the ſea, and inland that of Dornadilla, and an elevated plain on the weſt of Loch Loil, called Dirrymore foreſt[8]: that diſtrict called Rae's Foreſt, conſiſts of a bed of rock, interſperſed with patches of moraſs. The chief mountains are Ben Hop, and Ben Lugal: further to the weſt no names occur, except that of Cape Wrath, and the region is deſcribed by an intelligent traveller in the following terms[9]:

Cape Wrath. "But a wide extent of deſart country lay before us, and exhibited a moſt auguſt picture of forlorn nature. The proſpect was altogether immenſe, but wild and deſolate beyond conception. The mountains preſented nothing to view but heath and rock; between them formleſs lakes and pools, dark with the ſhades thrown from prodigious precipices, gave grandeur to the wilderneſs in its moſt gloomy forms." Curioſity has been appalled, and no traveller has penetrated into the wilds of Aſhir, for ſuch is the name of this diſtrict, which is by our ſeamen corrupted into Old Shores; but from the vaſt caverns in the vicinity of Cape Wrath, it is probable that the environs are chiefly calcareous[10].

[8] Cordiner's Letter to Pennant, p. 111. [9] Ibid. 104.

[10] Statiſt. Account, vi. 279. (Pariſh of Edrachills.) The account of the intereſting pariſh of Durneſs, in which Cape Wrath ſtands, vol. iii. 576. is very lame and defective; if we truſt the Author, p. 579, the whole [illegible], and Cape Wrath affords excellent paſturage for ſheep.

Having

Having thus explained at ſome length, the directions and poſitions of Scotiſh mountains, becauſe they conſtitute the moſt remarkable feature of the country, and yet have never received due illuſtration, their conſtituent parts remain to be briefly examined". On entering the Highlands, near Dunkeld, the firſt ridges are alluvial hills of gravel, containing pebbles of micaceous ſchiſtus, quartz, and granite, ſometimes ſurmounted by ſlate, and argillaceous ſchiſtus. The rocks immediately to the north of Dunkeld, are compoſed of micaceous ſchiſtus, penetrated in every direction by veins of quartz. From the junction of the Tay and Tumel, weſtward to Loch Tay, the northern bound of the vale is of the ſame ſubſtances, ſometimes interſperſed with garnets. The whole ſummit of the higher chain is covered with large rounded maſſes of granite. The ſouthern ſhores of Loch Tay, conſiſt of micaceous ſchiſtus, with a few garnets, interrupted about the middle with banks of compact bluiſh grey lime-ſtone. The northern ſhores ſimilar, but the lime-ſtone is micaceous. The mountains in Glenlochy are moſtly of micaceous ſchiſtus, interſperſed with garnet: Glen Lyon preſents ſmall veins of lead. The vale of Tumel, between Loch Tumel and Loch Rannoch, is overſpread with rounded fragments of granite and micaceous ſchiſtus, but contains granitoid, and ſome granite. The lower part of Glen Tilt chiefly exhibits micaceous ſchiſtus; the upper principally granite and lime-ſtone. MOUNTAINS.

Such are the more ſouthern parts of the Highlands. In the weſt, towards Ben Lomond, micaceous ſchiſtus alſo abounds; but that mountain is chiefly of gneiſs, and the like features are found in the peninſula of Cantire. In the north of Argyleſhire *, appears the beautiful red granite, which chiefly conſtitutes the central chain, already indicated; to the north of which firſt appears micaceous ſchiſtus, and afterwards a remarkable courſe of pudding-ſtone, extending from Loch Neſs

" Mr. Aikin's Notes. According to Mr. Playfair, in his Illuſtrations of the Huttonian Theory of the Earth, Edin. 1802, p. 346, *et ſeq.* there are only two large inſulated tracts of granite in the ſouth of Scotland, one in Kirkcudbrightſhire, another in the Lammermuir, near Prieſtlaugh. But this author is ſo fond of theory, that his facts are received with heſitation.

* Cruachan, according to Mr. Jameſon, conſiſts, at the bottom, of ſlate and micaceous ſchiſtus, which is followed by granite to the top. Near Stroutian are red granite and gneiſs. Glen Co preſents curious porphyries.

Mountains. to Oban *. The mountains in the north have been little explored, but Mr. Jameſon tells us, that the coaſt is chiefly a coarſe argillaceous ſand-ſtone, often appearing in the form of flags, while in ſome places are maſſes of breccia, being pebbles of red granite, micaceous ſchiſtus and quartz, in arenaceous baſes. Mount Scuraben is at the bottom ſand-ſtone, and ſand-ſtone flag, then the breccia, ſucceeded by a rock of white quartz to the ſummit, and probably forming the root and centre of the whole. Morben, and other mountains in this diſtrict, from their white colour, ſeem to be of the ſame compoſition. About the Ord of Caithneſs appear granite and micaceous ſchiſtus, and that mountain conſiſts of mingled quartz and felſpar. Near Dornoch, the rivers roll pebbles of micaceous ſchiſtus and granite, evincing the materials of the mountains, but their lower ſtrata conſiſt of argillaceous ſand-ſtone, till near Tain, where are granite, micaceous ſchiſtus, and hornblende. The ſand-ſtone and breccia re-appear at Cromarty, and at Murray Firth, but at Fort George the primitive rocks begin. About two or three miles S. of Aberdeen, the red-coloured argillaceous ſand-ſtone and breccia again occur; and the caſtle of Dunotter ſtands on a rock of the latter ſubſtance.

The central and weſtern parts of Sutherland and Roſsſhire, have not been explored; but it would ſeem that the weſt of Sutherland is chiefly primitive lime-ſtone, which is well known to form a great part of Aſſynt, and ſometimes contains maſſes of white marble. The mountains ſeem to be of granite and micaceous ſchiſtus, but often preſent the ſingular feature of vaſt ſummits formed of white quartz. According to Williams, this quartz is ſtratified, and tinged with blue, or bluiſh grey; and bears no vegetation, ſo that at a diſtance it reſembles ſnow. Near Loch Broom is found that ſort of granite which is beſt adapted for mill-ſtones.

Upon the whole it would appear, that the chief or granitic chain of the Scotiſh mountains, extends in a S. W. and N. E. direction from

* According to Williams, II. 159. a like range extends through Perthſhire, into Monteith and Dunbartonſhire, croſſing the Clyde, near Dunbarton, and reaching the weſt ſide of Ayrſhire, where it enters the Firth of Clyde; it hence ſeems to follow, in the ſame direction, the grand granitic chain of Scotiſh mountains.

Ben

Ben Nevis to Portſoy. In many parts it has ſunk or ſubſided, as not unuſual, but the line is marked by the gradual tranſitions from lime-ſtone and ſand-ſtone, to micaceous ſchiſtus, and thence to granite. Ben Nevis, Cairngorm, and other lofty ſummits, mark this primitive chain. The Grampians, which form the outer ſkirt of this chain, conſiſt, according to a German mineralogiſt [11], of micaceous lime-ſtone, gneiſs, porphyry, ſlate, and granite, alternating with each other; and another German ſays, that the fundamental rock of the country conſiſts of granitic aggregates. The mountains in the S. W. are chiefly ſchiſtoſe, and the granite is grey, and of an inferior kind; but Mr. Williams informs us, that Ben Nevis, and other mountains in that quarter, are compoſed of elegant red granite, in which the pale roſe, the bluſh, and the yellowiſh colours, are finely mixed and ſhaded [12]. The like granite is found at Portſoy and Trouphead, and is probably continued through the whole chain, the ſuperior height of the region being marked by the extreme rapidity of the river Spey. This tendency of the leading chain, is not only marked out by the Grampians, but by that of the iſlands, and of the grand chain in Norway, which, indeed, ſeems a continuation of the Scotiſh chain, and the laſt, probably contains ſilver as well as the Scandinavian. The mountains on the N. W. of the lakes Neſs and Linny, are probably only exterior ſkirts of the ſame chain, and preſent the uſual declenſion of micaceous ſchiſtus, terminating in limeſtone and ſand-ſtone, in the northern parts of Sutherland and Caithneſs. The iſlands of Shetland chiefly preſent micaceous ſchiſtus, interſperſed with a few maſſes of granite; and the Orkneys, &c. conſiſt moſtly of ſand-ſtone. The weſtern iſlands may be ſuppoſed to be chiefly calcareous. It is remarkable that the ſpace from Inverneſs to Dunolla, on the weſt, abounds with farcilite (pudding-ſtone) compoſed of pebbles of quartz, probably waſhed down from the granitic chain, and afterwards cemented by ſome unknown proceſs of nature, either by iron or ſiliceous earth.

Mountains.

General Roy mentions two remarkable features of the Highlands, firſt the moor of Rannoch, a high deſert of twenty miles ſquare, on the

[11] Kirwan's Geol. Eſſays, 481. [12] Mineral. King. II. 13.

Mountains S. E. of Ben Nevis, being a flat uninhabited moraſs. The ſecond is part of the N. W. coaſt, extending from Loch Inchard, twenty-four miles to the ſouth, breadth about ten miles, which preſents a moſt ſingular appearance, as if mountains had been broken into fragments, interſperſed with pools of water. The northern extremities of Caithneſs, are low and moraſſy, and ſeem calcareous, as well as thoſe of Sutherland.

Foreſts. The foreſts of Scotland are very rare in the proper acceptation of the term; and the Sylva Caledonia has long ſince vaniſhed. The whole county of Selkirk was formerly denominated Ettric foreſt. There was alſo a conſiderable foreſt, that of Mar, in the weſt of Aberdeenſhire, where now remains the foreſt of Abernethy [*], extending to Cairngorm. In the county of Sutherland was the foreſt of Sletadale, on the north of Dunrobin, the ſeat of the earls of Sutherland; and in the north of the ſame county, are marked Parff-foreſt, between Aſhir and Dunan (probably originally Wharf foreſt, by the ſame name as the cape); to the ſouth of which were Reay foreſt, or that of Dirrymone; with thoſe of Dirrymore, and Dirrymena, on the north and ſouth of Loch Shin. No other foreſt occurs till we reach the county of Argyle, which contains Boachiltive foreſt on the north. Mention is made by late travellers of a royal foreſt near Loch Ketterin, called Finglas; but for this there ſeems no authority. The foreſt of Athol, in the ſame county, does not appear liable to the ſame objection.

Botany. Having given a general account of the indigenous plants of England, it will ſuffice for the botany of Scotland, to point out the particulars in which the two floras differ, together with the cauſes of the difference.*

The northern part of Britain differs from the ſouthern as to climate, in being colder and more rainy; and as to ſoil, in conſiſting chiefly of mountainous granitic, or micaceous diſtricts, the higheſt peaks of which are buried in perpetual ſnow. There are no chalk-hills in Scotland; nor any of that ſoil which characteriſes the ſouth-eaſtern part of the iſland, and is compoſed, for the moſt part, of ſand and calcareous marl. We might, therefore, *a priori*, expect to meet with more alpine plants

[*] Prov. of Moray, Aber. 1798. 8vo. p. 267.

* Smith's Flora Britannica.—Lightfoot's Flora Scotica.

in Scotland, than of those which flourish best in a light chalky soil, and in a mild climate; this is found to be in fact the case. The greater number of vegetable species is the same in both countries; but the warm, moist region of Cornwall, Devonshire, and Dorset; the range of chalk-hills, on each side of the valley of the Thames; the dry, sandy tracts of Norfolk, Suffolk, and Cambridge, and the fens of Lincolnshire, contain many plants that are unknown to Scotland; as, on the other hand, the snowy summits of the Grampians, the extensive forests of Badenoch and Braemar, and the bleak, shelterless rocks of the Hebudes, possess many hardy vegetables, which are not to be found in England. South Britain contains a greater number of species peculiar to itself; but those that are similarly circumstanced in the northern part of the island, are of more frequent occurrence, and therefore more characteristic: to the English botanist, Scotland will have more the air of a foreign country, than England will to a Scotish naturalist. Amidst the grand romantic scenery of the Highlands, the search of the English botanist is continually solicited and repaid, by the appearance of plants, either altogether new to him, or which he has been accustomed to consider as the rare reward of minute investigation. In traversing the vast natural forests of birch and pine, although his notice will be first attracted by the trees themselves, in every stage of growth, from the limber sapling, to the bare and weather beaten trunks, that have endured the storms of five or six hundred winters, yet the new forms of the humbler vegetables will soon divide his attention; the red and white blossoms of the trailing *Linnæa*, the *Pyrola secunda*, and *uniflora*, *Satyrium repens*, *Ophrys corallorhiza*, and *Convallaria verticillata*, will each attract their share of regard. If he be winding along the rocky margin of Loch Tay, or Loch Ness, the *Eriocauton decangulare*, the alpine *Circæa*, the minute *Subularia aquatica*, will reward his labour; the moist and shady recesses of the slate mountains, are carpeted by the three *Veronicas*, the *alpina*, the *saxatilis*, and *fruticulosa*; by the *Saxifraga umbrosa*, the *Thalictrum alpinum*, and *Erigeron alpinum*. In the thin peat moors that overspread the rocks, are found the *Schoenus rufus*, *Scirpus multicaulis*, *Jucus trifidus*, *biglumis*, and *spicatus*, all of them belonging to the natural class of rushes; with the Alpine cotton-grass, and some of the dwarf species of *willow*.

Botany.

Botany. *willow*. The mountainous diſtricts of granite are peculiarly rich in alpine plants; the ledges and crevices of the rocks are adorned by tufts of the golden cinquefoil (*Potentilla aurea*); and luxuriant feſtoons of the *Arbutus alpina*, and *Arbutus uva urſi*, glowing with their ſcarlet and deep blue berries, among their gloſſy leaves; the leſs precipitous parts, and the borders of the torrents, are overſpread with alpine graſſes, with the viviparous *Polygonum*, the *Azalea*, and *Sibbaldia procumbens*, the yellow *ſaxifrage*, the *Dryas octopetala*, *Rhodiola roſea*, *Rubus arcticus*, and the alpine *Alchemilla*. The cloudberry (*Rubus chamæmorus*), and ſome of the *lichens* flouriſh amidſt the ſnow and ſolitude of the moſt elevated ſummits; and afford at the ſame time ſhelter and food for the Ptarmigan, almoſt the only one of our native birds that can inhabit ſo cold a ſituation. The Lowlands of Scotland ſeem to contain no plants which are not found in ſimilar ſoils in England; the ſea-coaſt, however, exhibits two umbelliferous vegetables, the *Ligueſticum Scoticum*, and *Imperatoria Oſtruthium*, which have not been met with on the ſouthern ſhore.

Zoology. The Zoology of Scotland preſents little remarkable, as diſtinct from that of England. The ſmall horſes of Galloway ſeem to have been a primitive breed, and, in diminutive ſize, are exceeded by thoſe of Shetland. The cattle in Galloway are often without horns, a defect which is ſuppoſed to be recompenſed by the ſuperior quantity and quality of the milk. The kylies, as already mentioned, are a middle-ſized breed from the province of Kyle, and other diſtricts of Ayrſhire and Galloway. On the eaſt are found large cattle, of various breeds. The ſheep are ſmaller and ſhorter than thoſe of England, but are now croſſed in various directions; thoſe of Shetland are remarkable for the fineneſs of the wool, which is, however, interſperſed with coarſer piles. Goats are not ſo numerous in the Highlands and Iſles, as might be expected: this animal not only enlivens the Alpine landſcape, but yields uſeful leather and milk, and might occaſionally ſupply the want of other proviſion. Of dogs, no breed is remembered peculiar to Scotland; but the ſhepherd-dogs in the province of Galloway, are endowed with remarkable ſagacity, ſo as to underſtand and execute even complicated commands.

Of

Zoology.

Of wild animals, the wolf has been extirpated in Scotland, only ſince the year 1680. The wild cat is ſtill occaſionally found; the other claſſes correſpond with thoſe of England, except that the Roe is ſtill not unfrequent. Among the birds, eagles are not unknown, nor elegant falcons. The ſhores and iſlands preſent numerous kinds of ſea-fowl. In the progreſs of cultivation, ſome new birds have appeared from England; for inſtance, the golden-creſted wren, which even viſits Shetland, after a flight of ſixty miles, which is ſurpriſing for ſo diminutive a bird [15]: but the nightingale, who would be a moſt welcome gueſt, ſtill refuſes the journey.

Scotland abounds with fiſh of all kinds, and contributes great ſupplies to the Engliſh market, particularly in lobſters and ſalmon. By ſome ſingular chance, the holibut, a coarſe dry fiſh, is in Scotland ſtyled the Turbot, which in Scotland is called *Rodden-fleuk*, the laſt word being a general denomination for flounders, and other flat fiſh. The tranſparent lakes, rivers, and rivulets of Scotland, preſent a beautiful variety of fiſh: on the northern and weſtern coaſts are numerous ſeals; and it appears from the life of St. Columba, that the ancients had a mode of rendering them tame, and obedient to the call. The whale ſometimes appears, and the baſking ſhark frequently plays in the weſtern inlets. Pearls are found in the rivers Teith and Ythan, in a large kind of mya, or muſcle. Some large ones are in the ſhape of a pear, others are pink on one ſide. Many beautiful zoophites, on the northern ſhores, have been found and introduced to public notice, by Mr. Cordiner.

Mineralogy.

In conſidering the mineralogy of Scotland, it may be premiſed, that a country ſo mountainous muſt be naturally expected to abound with metals, and ſome fortunate accident may, perhaps, diſcover in ſome of the ſkirts of the granitic chain, ſilver mines, equal to thoſe of Norway; for ſuch diſcoveries ariſe not from a ſedulous or ſkilful inquiry, but from the trifling accidents of a ſhower of rain, of a ſhepherd running after a goat, or the like. Mr. Kirwan has given an excellent account of the various ſubſtances in which metals are generally found [16]. In granitic mountains, tin, lead, iron, zinc, biſmuth, cobalt; and in gneiſs, or ſchiſtoſe granite, ſilver, copper, lead, tin, and zinc. In micaceous

[15] Pennant's A. Z. vol. i. 39.

[16] Geol. Eſſ. 428.

MINERALOGY.

ſchiſtus are found copper, tin, lead, antimony; in hornblende ſlate, copper ore; under argillite, or common ſlate, ſilver, copper, lead, zinc. In ſteatite, ſulphureous pyrites, and magnet. In primitive lime-ſtone, appear copper, lead, zinc; and even in ſtrata of coal, have been found native ſilver, galena, and manganeſe. The ſmall quantity of gold found in Scotland, has been procured from the Lead-hills, which are moſtly compoſed of coarſe ſlate. This precious metal firſt appeared, as already mentioned, in the ſands of Elvan, a rivulet which joins the Clyde, near its ſource; and a place ſtill exiſts, called Gold-ſcour, where the Germans uſed to waſh the ſand. None worth mentioning has been found recently. The ſilver generally accompanies lead; and in the rich mines of Saxony, the baſer metals were found near the ſurface, but the richer at a great depth. The ſilver found in Scotland, has hitherto been of little account; the chief mine was that at Alva, which has ſince only afforded cobalt. Nor can Scotland boaſt of copper, though a ſmall quantity was found in the Ochills, near Alva, with ſilver and cobalt; and it is ſaid that the iſlands of Shetland offer ſome indications of that metal. Copper has alſo been found at Colvend in Galloway, at Curry in Lothian, at Oldwick in Caithneſs, and Kiſſern in Roſsſhire.

The chief minerals of Scotland are lead, iron, and coal. The lead mines in the ſouth of Lanarkſhire, where the gold was alſo found, have been long known. Thoſe of Wanlock-head, are in the immediate neighbourhood, but in the county of Dumfries, and belong to another proprietor. Theſe two mines yield yearly above 2000 tons. The Suſannah vein, Lead-hills, has been worked for ſixty years, and produced vaſt wealth *. Some ſlight veins of lead have alſo been found in the weſtern Highlands, particularly Arran. Iron is found in various parts of Scotland; the Carron ore is the moſt known, which Mr. Kirwan deſcribes as being an argillaceous iron-ſtone, of a blueiſh grey, internally of a dark ochre yellow [17]. It is found in ſlaty maſſes, and in nodules, in an adjacent coal mine, of which it ſometimes forms the roof. At the Carron-works, this ore is often ſmelted with the red greaſy iron ore from

* See Jars Voy. Met. who regards theſe as the richeſt mines of Europe. That of Arkingdale, in Yorkſhire, is now the firſt in England.

[17] Min. vol. ii. 174.

Ulverſton,

Ulverſton, in Lancaſhire, which imparts eaſier fuſion, and ſuperior value. Calamine, or zinc, is alſo found at Wanlock-head; and it is ſaid, that plumbago and antimony may be traced in Scotland *. MINERALOGY.

But the chief mineral is coal, which has been worked for a ſucceſſion of ages. Pope Pius II, in his deſcription of Europe, written about 1450, mentions that he beheld with wonder, black ſtones given as alms to the poor of Scotland. But this mineral may be traced to the twelfth century. The earlieſt account given of the Scotiſh coal mines is contained in a book, publiſhed by one George Sinclair, who calls himſelf Profeſſor of Philoſophy at Glaſgow, but I cannot trace him in the univerſity liſt ". He explains, with ſome exactneſs, the manner of working coal; and mentions the ſubterraneous walls of whin which interſect the ſtrata, particularly a remarkable one, viſible from the river Tyne, where it forms a cataract, and paſſing by Preſton-pans, to the ſhore of Fife. Mr. Williams has recently given his obſervations on this ſubject, with much practical ſkill. The Lothians, and Fifeſhire, particularly abound with this uſeful mineral, which alſo extends into Ayrſhire; and near Irwin is found a curious variety, called ribbon coal. A ſingular coal, in veins of mineral, has been found at Caſtle Leod, in the eaſt of Roſsſhire †.

In paſſing to the leſs important minerals of Scotland, the new earth found at Strontian, in the diſtrict of Sunart, and pariſh of Ardna-

* Plumbago is found in conſiderable quantities near Cumnock, in Ayrſhire. It is ſaid to be a continuation of a bed of coal, which, being intercepted by a vein of grunſtein, changes to plumbago, which becomes the purer as it approaches nearer to the grunſtein. This laſt ſubſtance and trap, or baſalt, are in Scotland called *Whin*, a word which, being merely provincial and unknown to the mineralogiſts of Europe, ought to be diſmiſſed from exact nomenclature. Manganeſe is found in Aberdeenſhire. It is alſo ſaid that corindon has alſo been diſcovered in the ſame county.

" Nat. Phil. improven by new Exp. Edinb. 1683. Quarto, p. 258—302.

† It is ſuppoſed that the largeſt untouched field of coal in Europe exiſts in Scotland, in that ſingular barren track of country in Carluke and Cambuſnethan pariſhes, Lanerkſhire, continuing with intervals to Douglas pariſh, to Glenbuck and Muirkirk, in Ayrſhire, and thence to the town of Ayr. The Cleugh or Wilſon-town, in Lanerkſhire, is the S. E. of this coal field, which is excluded by the Shot-hills, but extends on the weſt along the baſon of Clyde. This ſupply of coal would be of great importance, as my correſpondent ſuppoſes that all that exiſts between the Forth and the Eſk will be exhauſted in forty years. From a letter of Gilbert Laing, Eſq. Oct. 1805.

See alſo two ſpirited and ſatisfactory pamphlets, by Stewart of Allanton, Edin. 1800, 8vo; whence it appears that this great coal tract extends like an iſoſceles triangle, the vertex being near Glaſgow, and the baſe towards Carluke, the length being about twenty-two miles.

MINERALOGY.

murchan, Argyleſhire, is now conſecrated in numerous ſyſtems of mineralogy and chymiſtry. Ben Nevis affords beautiful granite. Fine ſtatuary marble is found in Aſſynt, and at Blair Gowrie, in Perthſhire. A black marble, fretted with white like lace-work, occurs near Fort William; dark brown with white at Cambuſlang, Clydeſdale. Jaſper is found in various parts; Arthur's ſeat offers a curious variety; and on the weſtern ſhore of Icolmkill, are many curious pebbles, of various deſcriptions [19]. Fuller's earth is found near Campbeltown, in Cantire; and, it is ſuppoſed, that there muſt be a vaſt maſs of talc, equal to that of Muſcovy, in the mountains which give riſe to the river Findorn, as large pebbles of it are ſometimes found in that ſtream. The pearls have been already mentioned: but that any of the gems are found in Scotland, ſeems dubious. Quartz and fluor aſſume various hues; and what are called falſe ſapphires, rubies, emeralds, &c. fall under one or other of theſe deſcriptions, while the real gems belong to the argillaceous claſs, and when examined with a microſcope, are found to conſiſt of minute layers, a form common to the argillaceous deſcription *.

The

[19] Garnett's Tour.

* The author has ſince been favoured with ſome notes upon this intereſting ſubject by W. A. Cadell, Eſq. who is not a little converſant in this branch of ſcience. The mamelated ore of zink is among the products of the Lead-hills. Hartfell is of primitive argillaceous ſchiſtus; its mineral water is vitriolated, that of Moffat ſulphurated. On the hill near Langholm are found maſſes of calcedony. Near Broxmouth is black marble, with large madrepores Slates are worked near the Cairns Inn, Loch Ryan. At Friſky, twelve miles below Glaſgow, there is an old wall compoſed of trap from the neighbouring hills, containing maſſes of beautiful prehnite. The rock of Dunbarton caſtle is trap.

Near Killierankie is hornblend ſchiſtus. At Balmerino are found eyed agates on the ſhore in conſiderable quantities; the neighbouring rocks ſeem to contain thoſe ſtones, as do thoſe of Scot's craig, oppoſite to Dundee. Beautiful agates are alſo found in the river May, but the lapidaries of Edinburgh are chiefly ſupplied from the ſouth bank of the river Eſk, oppoſite Montroſe. Near Aberdeen the granite is grey, but at Peterhead red. At Strontian were found zeolite and ſtaurolite, but the laſt not in croſſes. Loch Awe abounds in lapis ollaris, of which Kilchurn caſtle is built, and ſeveral ornamental tombs of this ſtone occur in the church-yard of Glenorchy, and in an iſle in the lake. The weſtern ſummit of Cruachan is red granite, and the upper part of the mountain is compoſed of large blocks of the ſame ſtone heaped together, a not unuſual circumſtance, granite being often in large rhomboidal diviſions, and dividing eaſily by thoſe natural ſeams. The only place in Scotland where flint ſeems to be found, is on the weſtern ſide of the iſle of Mull. Ulva preſents columnar baſalt. In Icolm Kil there is a ſtratum of white marble, of a ſchiſtoſe texture, containing ſteatite, which traverſes the iſland from N. W. to S. E. the croſſes are of gneiſs, the cauſy of granite. Gypſum is rare in Scotland, but a ſmall vein of the red kind is obſervable in Campſey hills, near Dunbarton.

Stirling

The mineral waters of Scotland are numerous, but none of equal fame with thofe of England. The chief are Moffat wells in the fouth, and thofe of Peterhead in the north. Mineral Waters.

Scotland, like other mountainous countries, abounds with fingular fcenes, and natural curiofities. The caves on the fhore near Colvend, in Dumfriesfhire, are worth notice; and the beautiful falls of the Clyde, near Lanark, have defervedly excited much attention. In proceeding up the river from Lanark, firft occurs a fmall cataract, called Dundaff Linn, then that of Corra, the moft picturefque; and little more than half a mile further, that of Bonnington appears, a fingle cafcade, of about twenty-feven feet. To the weft of Lanark is found the cataract of Stone Byres, beyond which falmon cannot pafs up the ftream. On the eaft of this part of Scotland, are the paftoral vales of the Tweed and Teviot, celebrated in fong; the deep pafs of the Peaths; and the romantic rock of Bafs, the haunt of the folan goofe; and a well near Edinburgh abounds with petrol. The bafaltic columns of Arthur's feat deferve infpection. On the northern fhore of the Forth, near Dyfart, a coal mine has for ages been on fire, probably from decompofed pyrites, and has fupplied Buchanan with a curious defcription. The beauties of Loch Lomond have been fo often defcribed, that it is unneceffary to repeat fo trivial a theme; but the *Trofacs*, or fingular hills around Lake Ketterin, &c. form a new acquifition to the traveller. The hill of Kinnoul near Perth, is a great curiofity, prefenting a mafs of uncommon minerals. The numerous lakes and mountains need not be again men- Natural Curiofities.

Stirling caftle ftands on grunftein, which has fomething of a columnar form, and decompofes in fpheroidal ftrata. At Airthy is a copper mine worked at prefent. One of filver exifted at Binny-craig, on the fouthern fhore of the Forth. Pentland hills feem to be trap; that neareft Edinburgh, on the Linton road, is agate rock. Braid-hill and Blackford-hill are likewife trap, in the latter veins of jafp-agate and jafper. Craig Lockhart and Corftorphin hills are grunftein. The Caftle hill of Edinburgh black bafalt with prehnite. Salifbury Craigs trap, grunftein of red felfpar and black hornblend, jafper with fpots of iron, &c. Calton-hill partly porphyry, light red fpots upon a purplifh ground; chryftala are found of twenty-four fides, refembling leucite, but of a redifh colour. Inchcolm prefents thin veins of fibrous green ferpentine in a decompofed trap. Bafs is of redifh trap; at the harbour of Dunbar is a caufy formed by the extremities of hexagonal columns of a red ftone (trap or jafper?) traverfed by veins of a fine white hornftein. (See Pococke, Ph. Tr. lii.) Coal is only wrought in Scotland in the two bafons of the Forth and the Clyde, including that of the Ayr.

tioned.

NATURAL CURIOSITIES

tioned. The rocks off the coaſt of Aberdeenſhire, often aſſume ſingular forms of arches and pillars, &c. and the ſpace from Trouphead to Portſoy, abounds in uncommon rocks, and ſingular marine productions. The caves of Nigg, in Roſsſhire, may be worth viſiting; and the more northern ſhores preſent innumerable wild ſcenes of ſavage nature. Near Lathron, in Caithneſs, is a large cave, into which the inhabitants ſail to kill ſeals. Noſs-head preſents a ſingular quarry of ſlate, marked with various metallic figures. The iſles Stroma, near the northern ſhore, preſerve dead bodies for a long time without corruption [20]. It may, perhaps, be eſteemed a natural curioſity, that the river of Thurſo was ſo abundant in ſalmon, that 2500 have been caught in one morning. Near Tong is the cave Fraſgill, about fifty feet high, and twenty wide, variegated with a thouſand colours, which are loſt in each other with a delicacy and ſoftneſs that no art can imitate [21]. On the eaſt of Durneſs, is the cave of Smo, within which is the reſemblance of a gate, ſucceeded by a ſmall lake of freſh water, containing trout; the extent of this ſubterraneous lake, has never been explored: and near Sandwit is ſaid to be a ſmall grove of hazels, about four inches high, bearing nuts. The ſingularity of the coaſt of Edrachills, ſouth of Loch Inchard, has already been mentioned. But the verdant paſtures of Farouthead and Cape Wrath, may well be eſteemed a natural curioſity in that diſtant region, where the want of roads and bridges remains a diſgrace to the country. The weſtern coaſt of Roſsſhire does not ſeem to contain any object worth mentioning, and that diſtrict remains to be explored by the curious traveller. We only know the grand cataract of Kirkag river, and the cave of Gandeman, near Aſſynt point. The caſcade of Glamma, in the heights of Glen Elchaig, is truly ſublime, amidſt the conſtant darkneſs of hills and woods. Ben Nevis will, of courſe, attract notice from its ſingular form and elevation. According to Mr. Williams [22], it conſiſts of one ſolid maſs of red granite, which he traced at the baſe for four miles along the courſe of a rivulet on the eaſt; the height of this maſs he computes at 3600 feet, and above it are ſtratified rocks, the nature of which he does not explain; but, he ſays, that thoſe on the ſummit are

[20] Bryce's Map, directed by Mac Laurin. [21] S. A. III. 519. [22] Vol. ii. 63.

so hard and tough, that wrought iron falls short of them. The stupendous precipice, on the north-east side, exhibits almost an entire section of the mountain. In Argyleshire, the marine cataract of Loch Etif, the beautiful lake of Awe, and environs of Inveraray, present the chief objects of curiosity. Natural Curiosities

SCOTISH ISLES.

The Islands that belong to Scotland are numerous and important, and fall naturally into three grand divisions; the Hebudes *, or Western Islands; the Orkneys; and the islands of Shetland. Scotish Isles.

On passing the conic rock, called Ailsa, towards the north, two beautiful islands adorn the Firth of Clyde, those of Arran and Bute [1]. The first is about twenty-three miles in length, by nine in breadth, and has 7000 inhabitants. The chief place is the village of Ranza; and Brodic castle is memorable in history. The exports are black cattle and barley [2]. Mr. Jameson has recently published an account of this island, particularly its mineralogy, from which it appears that it is a mountainous region: and Goatfell is near 3000 feet in height. The southern parts of the island present low and cultivated grounds; the base is chiefly sand-stone and granite, the former traversed by veins of basalt. Near Lamlash, is an extensive vein of pitch-stone, of a greenish colour, and the black also occurs. There is also granitine, composed of quartz, felspar, and hornblende; micaceous schistus likewise abounds; there is little coal. Arran.

Bute is about twelve miles in length, by four in breadth; inhabitants about 4000; the chief town is Rothsay, and in the vicinity is Mount Stuart, the ornamented residence of the Marquis of Bute, and worthy of the distinguished taste of the noble proprietor. Bute.

To the west of the Chersonese of Cantire, begin the Hebudes, or Hebudes.

* This name was corrupted by Hector Boyce, into Hebrides, a name still retained by those who prefer the old mumpsimus, to the new sumpsimus. Boyce was misled by an edition of Solinus, Venice, 1491, 4to. in which, among many errors of the press, Ebrides is put for Ebudes.

[1] Pennant's Voyage, 168. [2] Stat. Account, vol. ix. p. 169.

Western

Scotish Isles.

Weſtern Iſlands, properly ſo called. Theſe iſlands fall naturally under two diviſions, which may be termed Interior and Exterior Hebudes.

Interior Hebudes:

Ilay.

The firſt is Ilay, about the ſame length as Arran, but nearly eighteen miles in breadth. Ilay produces many black cattle, which are exported, and ſometimes paſs as far as England[3]. But the ſheep are rare; ſmall horſes are much uſed, as the country is not very mountainous. This iſle belongs to Mr. Campbell of Shawfield. Inhabitants about 7000. Lead mines were here diſcovered in the ſandſtone, 1763; this lead is, as uſual, mingled with ſilver. Copper has alſo been found, and there are appearances of emery, and even of plumbago. At Saneg-mor is an intricate cave.

Jura.

Jura is divided from the laſt by a narrow ſound: it is about twenty miles in length, but the breadth ſeldom more than five. It is one of the moſt rugged of the Hebudes, which, in general, are mountainous regions. The paps of Jura, a line of conic hills, preſent a ſingular appearance: they are on the weſtern ſide of the iſland, and almoſt bare of vegetation[4]. The beſt crops are potatoes and barley; and the iſle contains abundance of peat. The cattle are ſmall, but the ſheep excellent. Minerals, iron-ore and manganeſe; and there is a quarry of ſlate. The noted gulph or whirlpool of Brecan, or Corryvrekan, is on the northern extremity of Jura[5].

To the weſt of Jura are the iſles of Oranſa and Colonſa; and the ſtrait between them being dry at low water, they may be conſidered as one iſland, about ten miles in length. Soil generally light and arable, producing barley and potatoes. The venerable ruins of the ancient monaſtery of Canons regular, in Colonſa now exiſt no longer; but thoſe of a curious priory in Oranſa ſtill remain[6].

Mull.

The next iſle of any conſequence is that of Mull, one of the largeſt of the Hebudes, and ſurrounded with ſmaller intereſting iſlands. Mull is about twenty-eight miles in length, by a medial breadth of about eighteen. An intelligent traveller informs us, that the population is about 7000[7]. The climate cloudy and rainy. Chief diet of the people,

[3] S. A. xi. 278. [4] S. A. xii. 318. [5] Knox's View, ii. 451. [6] Stat. Acc. xii. 327.
[7] St. Fond, tome ii. p. 89.

potatoes

potatoes or barley-meal, with a little fish; drink pure water, sometimes a little whisky. Hovels constructed of whin; and the thatch guarded against the wind with large stones, the smoke ascending by a hole in the roof. The ingenious author observes, that the Esquimaux, and Laplanders, prepare better residences. On the N. E. is the new village of Tobermory, which it is hoped will be prosperous. According to St. Fond, this island contains a large portion of basaltes; and the mountain of Ben More presents to his eye appearances of lava. On the north of Ashnacregs he discovered a curious wall of basalt, forming a kind of ancient circus. It is, indeed, not a little remarkable, that while the opposite shores of Argyle present the same red granite which here pervades Scotland, in a line from the N. W. to the S. E. as already mentioned, yet Mull, which is directly in that line, seems to display no appearance of it, a circumstance which adds to the credibility, that in this neighbourhood may have been an ancient volcano, which deranged the course of nature. For though the volcanic system have been pushed by some French writers to a ludicrous excess, yet, when we consider the numerous volcanoes existing in Kamschatka, and particularly along the Andes, in South America, by many believed to have been a continent of later formation than those of the other hemisphere, it may seem mere prejudice, not to allow the existence of volcanoes, in certain instances; though fire be in general too potent an agent for the mild progress of nature, and, indeed, nearly accidental, while water is her grand and universal engine: but, on the other hand, when we reflect that basalt is strongly impregnated with iron, and that the basaltic columns are also found at Edinburgh, at Dichmont, Clydesdale, and in Skey, and extend over great part of the county of Antrim, we must allow a circle of about 600 miles for this eruption, far too vast for any volcano or volcanoes, and probably arising from the fermentation of iron in the interior of the globe. Mull stands in the centre of several small but interesting isles. On the east is Lismore, fertile in oats, bigge, or beer, often called by the vague name of barley, though it be a very distinct species from the English barley. This isle was anciently the chief seat of the bishops of Argyle, who were thence denominated Bishops of Lismore, and some ruins of their residence remain: it was in consequence

Scottish Isles.

 well

Scotish Isles.

well replenished with deer, and fables have arisen that it was once a forest. To the south of Lismore occurs Kerrara, remarkable for the death of Alexander II, in 1249[8]. To the vulcanist St. Fond[9], Kerrara seems partly volcanic, as it produces basalt; but it has also slate, and a fibrous micaceous schistus, composed of quartz, steatite, and mica.

Icolm-kill.

But the most curious objects in the vicinity of Mull, are Icolm-kill, and Staffa. Hyona, or Icolm-kill, is about three miles long, by one broad, and is venerable as the primitive seat of Scotish literature and religion, founded by St. Columba in the sixth century. Its history and ruins have been often described; but, it may be added, from a recent traveller, that the isle produces beautiful white marble, and large blocks of jasper, or rather indurated steatites[10]. The sacred edifices are partly constructed of red granite, resembling the Egyptian, which forms Icolm-kill, and the isle of Nuns adjacent, fragments of the great granitic chain, formerly mentioned. Some parts of the isle are said to present green and red jasper, elegantly veined, and some specimens of zeolite; in the bay of Martyrs, on the E. side, is found hornblende; and in the small haven, on the opposite part of the isle, are immense numbers of beautiful pebbles, chiefly serpentine, jasper, granite, marble, lapis nephriticus, nephritic asbestos, violet coloured quartz, and porphyry. These pebbles are rounded, and finely polished by the tide, which rolls immense quantities of them backwards and forwards, with a noise like thunder[11]. In botany this isle produces the beautiful sea buglos, and the sea holly; the Lapland willow, a scarce shrub, grows not far from the marble quarry: navel wort, marsh trefoil, and dwarf juniper, are also found.

Staffa.

Staffa, about six miles to the N. of Hyona, was first introduced to public notice by Sir Joseph Banks. Buchanan has mentioned the isle, but not its grand singularities, its beautiful basaltic columns, and one of the most surprising objects of nature, the vast basaltic cavern, called Au-ua-vine, or the harmonious grotto, a name now connected, as every thing is, with Fingal; but which may arise, either from a melodious sound, produced by the percussion of the waves at the furthest extre-

[8] Pennant, 357. [9] Tome ii. 170.
[10] Garnett, I. 266, corrected by Jameson, in his Mineralogy, and by the ocular observations of a friend. [11] Garnett, ib.

mity,

mity, or from the exact order in which the columns are disposed[12]. Height of the entrance fifty-six feet, breadth thirty-five, thickness of the exterior vault twenty. The depth, or length of the cavern is no less than 140 feet; and when St. Fond has represented the exterior light as penetrating the whole, he has committed a great error in perspective. Scotish Isles.

To the N. W. of Mull, are the isles of Tirey and Col, the former producing a most beautiful marble, of a rose colour, penetrated with small irregular crystals of green hornblende, and which the French naturalists have from the name of the isle called Tirite, no similar marble being any where found. Tirey is generally plain and fertile. Col, on the contrary, is rocky, but has several small lakes, replenished with fish. Dr. Johnson has paid a deserved tribute to its lord[13]. Tirey.

Another group consists of Skey, in the Scandinavian styled Skua, and the surrounding isles. Skey is the largest of the Hebudes, being about forty-five English miles in length, and about twenty-two in breadth. Inhabitants about 15,000; chief exports black cattle and small horses: the land, as usual in the Hebudes, rough and hilly. Muggastot is the residence of the Lord Macdonald, Dunvegan that of Mr. Macleod. At Struan is a Danish fort, sixty feet diameter, and eighteen high[14]. A high hill, near Talyskir, presents a series of basaltic columns, the most northern of this class: pillars pentagonal, and about twenty feet high*. Dr. Johnson, and his attendant Mr. Boswell, have well described the state of life and manners in Skey. The houses are chiefly turf, covered with grass. The face of the country wild, heathy, and deluged with continual rains. To the south of Skey are the isles Rhum and Eig: the first still produces red deer, an animal now rare in the isles; and in Eig is a curious cave, with forty skeletons, remains of the people here slain by a Macleod. To the N. E. of Skey are Raza and Scalpa; the harbour of Portree is protected by the former isle, and has a village of the same name, the only one in the country. The other isles in this groupe offer little memorable. Canna and Eig contain basaltic Skey.

[12] St. Fond, tome ii. p. 59. [13] Journey, p. 295. [14] Pennant, pl. 36.

* On the opposite side of the isle, near Portree, is another basaltic rock, of great height. Stat. Acc. xvi. 140. In Portree parish is a large cave, full of curious stalactites. Ib. 147.

Scotish Isles.

pillars, and in the former is Compaſs Hill, which ſtrongly affects the needle.

Exterior Hebudes.

It now remains to give ſome idea of the exterior chain of the Weſtern Iſles, forming, as it were, a barrier againſt the Atlantic. Two ſmall and remote iſles have attracted conſiderable notice. The firſt is that of Rona, about twelve leagues to the N. W. of Cape Wrath, and about thirty leagues W. from the Orkneys. This little iſle, with its companion Suliſka, or Bara, has almoſt eſcaped from the Scotiſh maps, being little known and rarely viſited. In the laſt century Sir George M'Kenzie, of Tarbat, afterwards Earl of Cromarty, drew up a ſhort account of Rona, from the oral information of inhabitants, at that time conſiſting only of five families[15]. As the iſle could only ſupport thirty inhabitants, any ſupernumeraries were ſent to Leuis, to their lord, the Earl of Seaforth, to whom they paid yearly a ſmall tribute of meal and feathers. Drift timber ſupplied their only fuel: he adds, that the wool of their ſheep was bluiſh, and aſcribes the ſame colour to thoſe of Hirta, or St. Kilda.

Rona.

Hirta.

The ſmall iſle of Hirta, or St. Kilda, muſt have attracted much notice, even in Leſley's time, for in his map he has repreſented it as about ſix times the ſize of Skey, while in truth it is only two miles and a half long, by one mile in breadth. St. Kilda is about twelve leagues to the weſt of North Viſt; and has been repeatedly deſcribed, the ſingular manners of its inhabitants having excited conſiderable attention, and for a minute account, the reader muſt be referred to Martin and Macauley. Sheep abound here, and in the little iſles adjacent, probably of the ſame kind with thoſe of Shetland; but the late accounts ſay nothing of the colour, and only ſpeak of the fecundity.

Leuis.

Having thus briefly mentioned theſe remote and little viſited iſles, the plan here followed muſt be reſumed by ſome account of Leuis, the principal iſland of the Weſtern chain. It is about fifty miles in length,

[15] Monro's Deſcript. of the W. Iſles, in 1549 Edin. 1774. Duodecimo, p. 63. The Stat. Acc. xix. 271, adds nothing.

by

by twenty in breadth. The face of the country consists of a heathy elevated ridge full of morasses S. W. to N. E.; but near the shores are several verdant vales capable of cultivation. The Harris, or south end of this isle, is still more mountainous, and presents what is called a forest, because some deer are there found. James VI attempted to introduce industry into the Hebudes by planting a Dutch colony at Stornaway in Leuis; but it was soon extirpated by the inhabitants *. Stornaway is however now a considerable and flourishing town, with an excellent harbour; the view from which, far to the east, presents the rugged mountains of Sutherland and Ross; and near it is the seat of the Earls of Seaforth, formerly proprietors of the island.[16] Besides cottages, there are about seventy houses covered with slate. The seasons in Leuis are oppressed with rain, as usual in the Western highlands and isles; but there is a considerable fishery. The crops are oats, bigge, and potatoes; no trees will thrive except alder, and mountain ash; and hardly a shrub appears: but there are many black cattle and sheep; nor is there any want of small horses. But the chief resource of Leuis must be the fishery, till industry shall have found the means of draining the upland marshes, and spreading an exuberance of lime as manure. At Classernes is a remarkable judicial circle, consisting of an avenue of thirty-nine stones about seven feet high, closing in a circle of twelve stones with one in the centre thirteen feet in height. Scotish Isles.

To the south of Leuis is North Vist, about twenty-two miles in length from E. to W. and about seventeen in breadth N. to S for recent discoveries have restored this isle to its proper form, among many other improvements which have taken place within these few years in Scotish geography. The face of the country corresponds in general with that of Leuis; and trees are equally unknown. Potatoes are generally cultivated. Westerly winds, with rain or fog, usurp two thirds of the year. Lord Macdonald is the proprietor.[17] North Vist.

* Mr. Marshall, in his Travels in Holland, &c. vol. i. p. 175, observes that, in the opinion of the Dutch, the only mean of establishing a fishery in the west of Scotland, would be to build a city, and make it the seat of the whole undertaking, as he there explains at length. But such a city would be far better situated on the western coast of Scotland, as the example of Stornaway proves. There is no town between Campbletown and Thurso, a space of 300 miles, though there seems to have been one on Loch Torig. Knox, ii. 473.

[16] Stat. Acc. xix. 241. [17] Stat. Acc. xiii. 300.

The

Scotish Isles. South Vist.

The ſmall iſle of Benbecula, and ſome others, lie betwixt North and South Viſt; the latter is about twenty-three miles in length N. to S. by about ten in breadth W. to E. The moraſſy central chain extends alſo through this iſle; but to the eaſt are dry hills covered with heath and verdure. The productions alſo reſemble thoſe of Leuis; and there are many ſmall lakes full of excellent trout. Chief exports black cattle and kelp. This iſle is alſo naked of wood.

Orkneys and Shetland Isles.

Orkneys.

The iſlands of Orkney and Shetland remain to be deſcribed. The Orkneys form a numerous group, around the Main Land, or what, by ſome new and fabulous term, is called Pomona.[18] The Main Land is about twenty five miles in length E. to W. by about thirteen in breadth N. to S. Kirkwall, the chief town of the Orkneys, contains about three hundred houſes; and has a ſtately cathedral dedicated to St. Magnus, length 226 feet, height of the roof 71, of the ſteeple 133. It is built of freeſtone, and by the good ſenſe and taſte of the Orcadians is preſerved more entire than even the Cathedral at Glaſgow.[19] Oppoſite ſtands the biſhop's palace, now called a caſtle. The chief exports of Kirkwall are beef, pork, butter, tallow, hides, calf ſkins, rabbit ſkins, ſalted fiſh, oil, feathers, linen yarn, and coarſe linen cloth, kelp,* and in fruitful years corn. The chief imports are wood, flax, coal, ſugar, ſpirits, wines, tobacco, and ſnuff, flour and biſcuit, ſoap, leather, hardwares, broad cloth, printed linens and cottons. In 1790 the exports were valued at 26,598*l.*; and the imports at 20,803*l.* Manufactures are linen yarn, and coarſe linens, and kelp: this laſt was introduced about ſixty years ago, and has been ſince diffuſed over the Highlands and iſles. In moſt parts of the Main Land the ſoil is good, though ſhallow, with a calcareous bottom. The horſes are ſmall but ſpirited; and the cows, though alſo ſmall, yield excellent milk. The ſheep in

[18] The old accounts are Wallace's 1693, and Brand's 1701; the modern, the Statiſtic Survey. See alſo an able account of the Orkneys by Dr. Barry, Edin. 1805, 4to.

[19] Stat. Acc. vii. 531.

* Sanda produces great quantities of kelp; when the Orkneys in general may yield 2,500 tons, 500 and 600 are drawn from that iſle only. S. A. vii. 455.

the iſlands of Orkney are computed at 50,000. Swine alſo abound of a dirty white colour, and diminutive ſize. The numbers of ſea fowl may be eaſily imagined. The Norſe language has yielded to the Engliſh, and the manners of the people are ſingularly civilized for ſo remote a region. The Main land contains ſeveral of thoſe edifices called Piks houſes, and on its weſtern ſide at Yeſtnaby, near the houſe of Skeil is a ſingular natural pavement, conſiſting of ſtones figured in various forms, reſting on a bed of red clay reclining on a high rock: the length of this ſingular pavement is about a quarter of a mile, breadth about twenty feet.[20] The Ward Hill of Hoy, the higheſt in this region, (1620 feet,) ſtands in the iſland of the ſame name, the S. E. promontory of which is erroneouſly called Walls in the Engliſh maps, inſtead of the native name Waes: near its bottom is the noted dwarfy ſtone, about 34 feet long by 17 broad, and 8 high, hollowed out by art, probably for the reſidence of ſome hermit. Scotiſh Isles.

The inhabited iſlands of Orkney are computed at twenty-ſix, and the people at 23,053;[21] the baſes are chiefly ſandſtone, and ſandſtone breccia, as appears from Mr. Jameſon's recent Mineralogy of the Scotiſh Iſles. Iron is found, and perhaps ſome lead; but the mention of ſilver and tin ſeems fabulous. Hazles are ſeen, and ſometimes willow, and ſome aſh trees; thorn buſhes, and plumb trees, ſtill exiſt in the Biſhop's garden. But in the moraſſes, trunks of ancient trees are found, ſometimes thirty feet in length. It is ſurpriſing that in the preſent progreſs of every art, numerous experiments have not been made to diſcover ſome tall tree, which can endure the ſpray of the ocean; for if a fence of ſuch were firſt reared, many other kinds might flouriſh under its protection. The mountain aſh, or the birch, which in Lapland is the laſt offſpring of expiring vegetation, may perhaps be found to anſwer this deſcription.

The iſlands of Shetland preſent another group ſimilar to thoſe of Orkney; with a Main Land or chief iſland in its centre. The Main Land is much interſected by the ſea: and is about fifty-ſeven miles in length, by about ten or twelve miles of medial breadth.* The other iſles Shetland.

[20] Wallace, p. 24. Brand, p. 43. [21] S. A. xx. 612.

* We have better charts of the coaſts of New Holland, than of the iſles of Orkney and Shetland. Captain Donelly's chart of the Shetland iſles, ſeems the moſt accurate, in which the Main Land correſponds

Scottish Isles.

isles are generally small, yet twenty-six are said to be inhabited. "On viewing these islands in general, a wonderful scene of rugged, bleak, and barren rocks presents itself to our view. No tree or shrub is to be seen, to relieve the eye in wandering over these dreary scenes. Sometimes however a few scanty portions of cultivated ground catch the eye of the traveller, exciting emotions of pleasure, and forming a striking contrast to the barren heath-covered mountains, which skirt them. The western part presents many scenes as wild and sterile as can well be conceived; grey rocks rising from the midst of marshes or pools, and shores bounded by awful sea-beat precipices, do not fail to raise in the mind ideas of desolation and danger.

"The coasts are in general rugged and precipitous, presenting in many places scenes truly grand and magnificent; vast rocks of various heights, dreadfully rugged and broken, opposing their rude fronts to all the fury of a tempestuous ocean; which in some places has formed great detached pillars, in others has excavated grand natural arches and caverns that mock all human magnificence; and strike the beholder with that awe and wonder, which must affect every one on viewing these amazing wrecks of nature." [22]

Such is the animated description of a late writer; who adds that the east side of the Main Land, and other isles, is comparatively low, but the west lofty and rugged. This is well known to be the case with most mountains and islands, because the winds and tempests from the west have more power than those from the opposite quarter. The hills in the Main Land run in three ridges from N. to S.; they are generally round and of little height. Ronas, the highest, stands detached in the N. W. corner of the Main Land; and is about 1500 feet above the level of the sea. When the same writer attempts to establish that all chains of mountains run according to the length of the country, he espouses

corresponds in length with Lewis, while Ainsley's would give a length of almost ninety miles. Yell and Unst, seem also more properly disposed in Captain Donnelly's map. The Danish Captain Von Lowenorn (Zach's Geographical Journal, May, 1799) found that the Shetland isles were about one third shorter than represented in the English map (Preston's); which also puts the northern extremity half a degree further north, than it was found by minute observations. Lowenorn published a map of these isles, in 1787.

[22] Jameson's Min. p. 2, 3. 8vo.

a mere theory in oppofition to ftubborn facts. The mountains of North America, the Uralian and fome other chains in Siberia; the tranfverfe chain through the centre of Africa E. to W. all eftablifh the contrary pofition. In Europe the mountains of Spain, the Alps, the Carpathian mountains; and, not to crowd examples, thofe of Ireland, Scotland, and even of England, have no connection with the length of the country, nor can a ftronger proof be produced of the boldnefs of theory than thus to remove even mountains from their feats; which proceed in every direction, bend and terminate without any vifible caufe, and have feldom any connection with the form of a country, as the deftructive powers of nature external and internal affail mountains even more than plains. Scotish Isles.

The hills in Shetland are chiefly compofed of fand-ftone breccia, &c. The bafis feems gneifs, and micaceous fchiftus, which are fometimes expofed to the air. Limeftone is alfo found and fome granite; but on the whole the mafs is arenaceous. A kind of brown wacken is found in Papa Stour; where may alfo be traced ftcatite, calcedony, red jafper, and fluate of lime. In Unft, the moft northern of thefe ifles, appear hills of ferpentine, containing actinote, labrador hornblende, tremolite, and talc; and the Shaw, the moft northern point of this ifle, and of the Britifh dominions, confifts chiefly of gneifs. Unft alfo produces iron-ftone, jafper or rather ferpentine, pure rock cryftals, and garnets of an elegant form. This remote ifle fupplies black oats, bigg, potatoes, cabbages, and various garden roots and plants, particularly delicate artichokes.[23] In general the granite, and micaceous fchiftus, appear furtheft to the north and weft. Sappare is found in the S. W. cliffs of the Main Land; and it is faid there are appearances of copper in the fame quarter. It was in the form of pyrites, and was worked for fome time, till the vein gradually decreafed and was abandoned.[24] What is called the bog ore of iron feems to abound in Fetlar, and of excellent quality.[25]

The

[23] Stat. Acc. v. 185. [24] Jamefon, p. 21.

[25] S. A. xiii. 283. From Mr. Jamefon's Mineralogy of the Scottifh ifles (2. vols. 4to.) it appears that Ailfa confifts chiefly of mingled hornblende and felfpar: Arran of reddifh fand-ftone, like Shetland, with veins of bafalt and pitch-ftone; but Goatfell prefents micaceous fchiftus and granite,

Scotish Isles.

The climate of the Shetland isles is variable, and disturbed with rains and thick fogs. The frosts are seldom severe, and snow rarely continues long on the ground. The inhabitants are indeed sufficiently wretched, without additional evils; and a benevolent government ought to pay a particular attention to those distant prisoners. The coruscations of the Aurora Borealis illuminate the long gloom of winter, and delight the inhabitants, who call them *merry dancers*. The arable land is mostly near the coast, and produces a coarse kind of oats and bigg. Potatoes have lately formed an addition of singular advantage; but turnips, parsnips, and carrots, are confined to the gardens of gentlemen. The chief food of the inhabitants consists of fish, and various kinds of sea fowl, which cover the rocks: the captors of the last shew singular skill and intrepidity, and often meet with a violent fate amidst the stupendous precipices. The cattle rather larger than those of Orkney, and the butter excellent if poperly prepared. Sheep are not uncommon, and have been recently praised for the fineness of their fleece. The horses have mettle and beauty, and on account of the singular minuteness of their size have become objects of luxury and curiosity in England. The swine are small, and little propagated because they injure the pastures; an evil easy obviated by the simple practice of putting a ring through the nose.

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granite, with yellow crystals, or rock topazes, commonly sold as Cairngorm stones. Bute, similar. Ilay, limestone, with granular quartz. Jura, granular quartz, with veins of basalt: this granular quartz is by Kirwan called arenaceous quartz, or primitive siliceous sand-stone. Seil, slate; Lismore, limestone, with basalt. Mull has much basalt, with sand-stone, limestone, &c. in the S. W. beautiful granite. Icolm-kill, mostly granite, and hornblende rock, with one quarry of marble. Coll, gneiss, with granite. Tirey, hornblende rock, gneiss, and basalt, with a quarry of beautiful marble. Eig, basalt, with limestone, &c. Rhum, red sand-stone, with veins of basalt; mountains, hornblende, and felspar. Canna basaltic; that at Compass hill affects the needle. Skey, basalt, with hornblende, limestone, &c. Rasa, sand-stone, and beautiful porphyry, with a blue basis.

The exterior chain of the Western Isles, was not visited by Mr. Jameson; but Lewis seems to abound in lime-stone, while Bernera is said to consist of amianthus.

The Orkneys consists almost entirely of sand stone, massy, and schistose; at Skeil, on the W. of the Main Land, the sand-stone, which looks rusty, as if slightly impregnated with iron, is worn (as already mentioned) into many singular forms, by the action of the weather, a circumstance which has greatly impressed the old describers of the Orkneys. A few miles around Stromness are granite, gneiss, micaceous schistus, and hornblende. Gramsey abounds in slate. Barry 17.

Lerwick,

Lerwick, the chief town or rather village, ſtands on an excellent harbour called Braſſa Sound, formed by the little iſle of Braſſa on the eaſt of the Main land, and formerly greatly frequented by the Dutch fiſhers. Lerwick is an irregular village, perched on rocks; and contains about 150 families. Near it is one of thoſe rude edifices called Piks houſes; and ſeveral others appear in the iſles of Shetland, particularly in Fetlar: there is alſo a rock abounding with iron ore which affects the compaſs. LERWICK.

The herrings appear off Shetland in vaſt columns, in the month of June, altering the very appearance of the ocean, which ripples like a current. Theſe columns have been computed to extend five or ſix miles in length by three or four in breadth, and in bright weather reflect a variety of ſplendid colours. They afterwards divide to the E. and W. of Great Britain, furniſhing a providential ſupply of food to many barren diſtricts. The chief exports of Shetland are fiſh of various kinds, chiefly herrings, cod, ling, and torſk, or tuſk. The inhabitants of the Shetland iſlands in 1798 were computed at 20,186,[26] more than the country can well ſupport, eſpecially in the preſent deficiency of intercourſe with the Dutch. They have of late become addicted to the uſe of tea and ſpirituous liquors, which will infallibly contribute to leſſen the population. In this diſtant region there are neither roads nor bridges, which may be pronounced the firſt ſteps in any country towards the progreſs of induſtry. The ſame deficiency occurs in the Orkneys, and even in the northern extremity of Scotland; where however a road has been recently opened between Ullapool and Dornoch. The Swiſs form roads even in the Alps; and certainly the Scotiſh Highlands do not offer more inſuperable barriers to this moſt eſſential of all improvements.

[26] Stat. Acc. xx. 612.

IRELAND.

CHAPTER I.

Names.—Extent.—Original Population.—Progressive Geography.—Historical Epochs.—Antiquities.

NAMES.

THE large and fertile island of Ireland, being situated to the west of Great Britain, was probably discovered by the Phœnicians as early as the sister island.* On the first dawn of history, and when the North-west of Europe was as obscure to the Greeks, as the islands on the North East of Siberia were recently to us, it would seem that Ireland constituted one of the Cassiterides. The poems ascribed to Orpheus deserve no credit, but it appears that the island was known to the Greeks by the name of Juverna, about two centuries before the birth of Christ. When Cæsar made his expedition into Britain, he describes Hibernia as being about half the size of the island which he had explored; and while the Romans maintained their conquests in the latter region, Ireland continued of course to be well known to them, and Ptolemy has given a map of the island which is superior in accuracy to that which represents Scotland. Towards the decline of the Western empire, as the country had become more and more known, and had been peopled with various tribes, the Romans discovered that the ruling people in Ireland were the Scoti: and thenceforth the country began to be termed Scotia, an appellation retained by the monastic writers till the

* For much recent information concerning Ireland, the author is indebted to Mr Hincks of Cork, a coadjutor in the New Cyclopedia; and it is generally given in his own words. The want of recent materials was regretted in the first edition.

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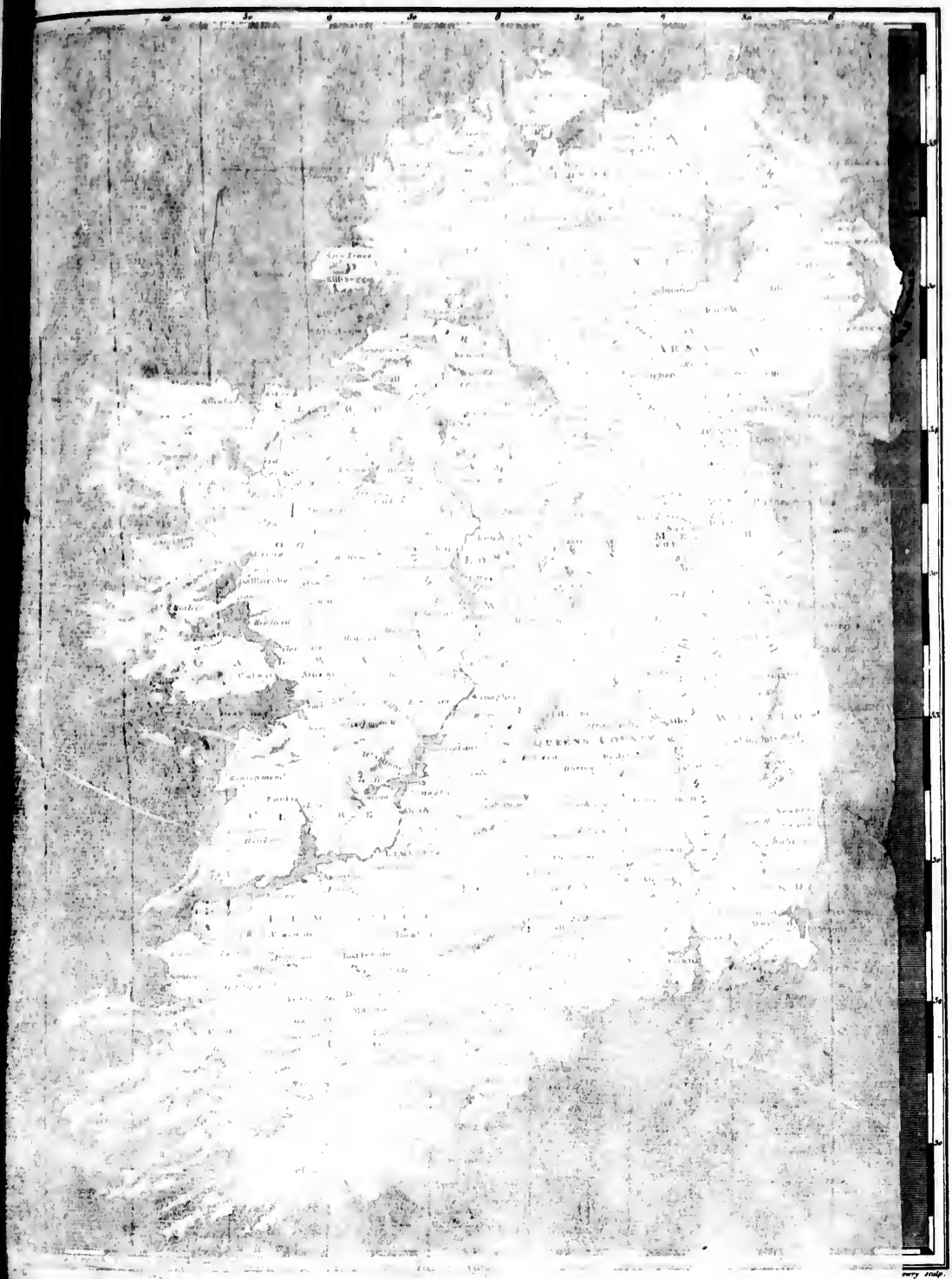

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R I L A N D.

CHAPTER I.

[illegible] Geography—H[illegible]

The [illegible] being frequented [illegible] discovered by the Phœnici[illegible] days of History, and whe[illegible] which the Ancients were as off[illegible] are to the Greeks, is the Isl[illegible] North [illegible] of Sil. If were necessary to [illegible], it would seem [illegible] on [illegible] Gallieno's. The poems attributed to [illegible] are certain, that it appears that the Island was known [illegible] by the name of Juverna, about [illegible] centuries before the birth [illegible] Vespasian [illegible], his expedition into Britain, he describ[illegible] as [illegible] from the size of the Island which he had [illegible] which the Romans maintained their conquests in the after re[illegible] continued of course to be well known to them, and Ptolem[illegible] a map of the Island which [illegible] in accuracy to that [illegible] from Scotland [illegible] towards the [illegible] of the Western [illegible] had [illegible] and [illegible] known, and had [illegible] which [illegible] to the [illegible] and the [illegible] In [illegible] the South [illegible] country [illegible] turn [illegible] appear [illegible] the [illegible]

From Various Surveys of Ireland.

Published March 1st 1802, by Cadell and Davies, Strand; and Longman and Rees, Paternoster Row.

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eleventh century, when the name Scotia having paſſed to modern Scotland, the ancient name of Hibernia began to reaſſume its honours. It is ſuppoſed that this name, and the Gothic denomination Ireland, are mere modifications of the native term Erin, implying the country of the weſt. NAMES, EXTENT, &c.

Ireland lies between 51° 19′ and 55° 23′ north latitude; and between 5° 19′ and 10° 28′ weſt longitude. Its greateſt length, meaſured on a meridian, is from the Stags of Cork harbour, to Bloody Farland point in the county of Donegal, which may be reckoned 235 miles; and the greateſt breadth, meaſured nearly on a parallel of latitude, is from the weſtern point of Mayo, to the mouth of Strangford Lough, 182 miles. The breadth, however, is very unequal in conſequence of the deep indentations on the weſtern coaſt, ſo that Galway and Dublin bays are not 120 miles diſtant from each other; and there is not a ſpot in the iſland more than about ſixty miles from the ſea.* The ſuperficial contents may be computed at 30,370 ſquare miles, or 19,436,000 acres; and the population being about four millions, there will be about 130 inhabitants to each ſquare mile. Extent.

It is probable that the original population of Ireland paſſed from Gaul, and was afterwards increaſed by their brethren the Guydil from England. About the time that the Belgæ ſeized on the ſouth of England, it appears that kindred Gothic tribes paſſed to the ſouth of Ireland. Theſe are the Firbolg of the Iriſh traditions; and appear to have been the ſame people whom the Romans denominated Scoti, after they had emerged to their notice by not only extending their conqueſts to the north and eaſt in Ireland, but had begun to make maritime excurſions againſt the Roman provinces in Britain. But Ireland had been ſo much crowded with Celtic tribes, expelled from the continent and Britain, by the progreſs of the German Goths, that the Belgæ almoſt loſt their native ſpeech and diſtinct character; and from intermarriages, &c. became little diſtinguiſhable from the original population except by ſuperior ferocity, for which the Scoti, or thoſe who affected a deſcent from the Gothic colonies were remarkable; while the original Gael ſeem to have been an innocuous people. Original Population.

* Beaufort's Mem. of a Map, &c. p. 14. The meaſures are given in Engliſh miles, which are leſs than Iriſh miles; eleven of the latter being nearly equal to fourteen of the former.

The

PROGRESSIVE GEOGRAPHY.

The map of Ireland by Ptolemy, above mentioned, is the firſt geographical document of the iſland. The general ſhape, rivers, and promontories, are delineated with as much accuracy as could have been expected. Nay as we advance into the middle ages, the geography of Ireland becomes more obſcure. The chief tribes mentioned by Ptolemy are the Darni upon the North eaſt, the Venicni and Robogdii on the North weſt. Beneath them are the Nagnati, Auteri, and Gangani, on the Weſt; the Erdini in the centre; and the Voluntii, Eblani, and Cauci, on the Eaſt; ſucceeded by the Southern tribes of the Menapii, Brigantes, Vodii, Ivelni, Velabri, and Luceni. Ptolemy alſo mentions ten towns; of which the chief is Eblana now Dublin. In the middle ages we find the Dalriadi on the north-eaſt; and the Crutheni on the north-weſt. The large tribe of Nelli occupy much of the centre. The Voluntii ſeem transformed into the people of Ullagh; the Erdini of Ptolemy yield the name to Argialla; and the Nagnati to Maigh Nais. The Gangani of Ptolemy ſeem the Galeng of the middle ages; the Menapii, &c. muſt be ſought in Muman, or preſent Munſter. The towns mentioned by Ptolemy might alſo be traced with ſome degree of accuracy.

The ravages of the Danes, in the ninth and following centuries, cannot be ſuppoſed to throw much light on the progreſſive geography of Ireland: but the ſettlements of the Engliſh under Henry II certainly contributed to that end, for Giraldus Cambrenſis at that period compoſed his deſcription of Ireland, which amidſt numerous fables contains ſome curious facts: and the geography of Ireland was little better known till the reign of Elizabeth, when Stanihurſt publiſhed his deſcription, which forms a part of Holinſhed's hiſtory, and was followed by that of Camden. The moſt remarkable diſtinction introduced by the new invaders into Ireland was that of the Engliſh Pale, or circuit of a few counties around Dublin, within which the Engliſh language was chiefly ſpoken. So inconſiderable indeed were the Engliſh poſſeſſions in Ireland, that the monarchs only aſſumed the ſtyle of Lords of Ireland, till the reign of Henry VIII, when king of Ireland became a part of the ſovereign's ſtyle. Nor was Ireland completely ſubjugated till the reign of the firſt James, who adds this merit to that of founding the American colonies;

but mankind will ever be infatuated by the triumphs of war, and prefer a meteor to the pure light of a pacific reign. In this, and the ſucceeding reign of Charles I, the preſent diviſion into counties was completely eſtabliſhed; and Sir William Petty's ſurvey of the iſland, the reſult of which was contained in his maps of the ſeveral counties, publiſhed in 1685, not only conſiderably added to the knowledge of the country, but has even been the ground-work of all the maps ſince publiſhed. PROGRESSIVE GEOGRAPHY.

The preſent diviſion of Ireland is as follows:

Province.	County.	Aſſize Town.
Ulſter	Antrim,	Carrickfergus.
	Down,	Downpatrick.
	Armagh,	Armagh.
	Tyrone,	Omagh.
	Londonderry,	Londonderry.
	Donegal,	Lifford.
	Fermanagh,	Enniſkillen.
	Cavan,	Cavan.
	Monaghan,	Monaghan.
Connaught	Leitrim,	Carrick on Shannon.
	Sligo,	Sligo.
	Roſcommon,	Roſcommon.
	Mayo,	Caſtlebar.
	Galway,	Galway.
Leinſter.	Louth,	Dundalk.
	Meath,	Trim.
	Dublin,	Dublin.
	Wicklow,	Wicklow.
	Wexford,	Wexford.
	Kilkenny,	Kilkenny.
	Carlow,	Carlow.
	Kildare,	Naas.
	Queen's County,	Maryborough.
	King's County,	Philipſtown.
	Weſtmeath,	Mullingar.
	Longford,	Longford.

Munſter

PROGRESSIVE GEOGRAPHY.

Province.	County.	Assize Town.
Munster	Clare,	Ennis.
	Limerick,	Limerick.
	Kerry,	Tralee.
	Cork,	Cork.
	Waterford,	Waterford.
	Tipperary,	Clonmell.

Historical Epochs.

The first historical epoch of Ireland is its original population by the Celtic Gauls, and the subsequent colonization by the Belgæ.

2. The maritime excursions of the Scoti against the Roman provinces in Britain.

3. The conversion of Ireland to Christianity in the fifth century, which was followed by a singular effect; for while the mass of the people retained all the ferocity of savage manners, the monasteries produced many men of such piety, and learning, that Scotia or Ireland became celebrated all over Christendom.

4. This lustre was diminished by the ravages of the Scandinavians, which began with the ninth century, and can hardly be said to have ceased when the English settlement commenced. The island had been split into numerous principalities, or kingdoms as they were styled; and though a Chief Monarch was acknowledged, yet his power was seldom efficient, and the constant dissentions of so many small tribes rendered the island an easy prey.

5. In the year 1170, Henry II permitted Richard Strongbow Earl of Pembroke to effect a settlement in Ireland, which laid the foundation of the English possessions in that country. There are however coins of Canute king of England, struck at Dublin, perhaps in acknowledgment of his power by the Danish settlers.

6. Ireland began to produce some manufactures about the fourteenth century, and her sayes or thin woollen cloths were exported to Italy. It is probable that these were produced by the Bristolian colony, which had passed to Dublin, as mentioned in the description of England.

7. Richard II king of England attempted in person the conquest of Ireland, but being imprudent and ill served, nothing of moment was effected.

effected. The ſubſequent attempts of the Engliſh monarchs to accompliſh this purpoſe need not be enumerated. HISTORICAL EPOCHS.

8. In the reign of James I, Ireland became entirely ſubjugated; and colonies of Engliſh and Scots were eſtabliſhed in the north.

9. The chief mean of the aſſimilation of the countries having been completely neglected, namely, the univerſal inſtitution of parochial ſchools, for the education of children in the proteſtant religion and Engliſh language, the Iriſh continued a diſtinct people; and being inſtigated by their fanatic prieſts executed their dreadful maſſacre of the Engliſh ſettlers in 1641. This inſurrection was not totally cruſhed till Cromwell led his veterans into Ireland.

10. The appearance of James II in Ireland to reclaim his crown, may alſo deſerve a place.

11. The amazing progreſs of Ireland in manufactures and commerce, within theſe twenty years, may be claſſed as the moſt illuſtrious of its hiſtorical epochs.

12. The deplorable events which have recently happened in Ireland, have led the way to its union with Great Britain, a meaſure which it is eagerly to be hoped will be productive of great reciprocal advantages.

Upon a review of the more ancient of theſe hiſtorical epochs, and of the monuments which may be conſidered as belonging to each, it muſt be conſidered that the edifices having been conſtructed of wood till the eleventh or twelfth century, it cannot be expected that any remains of them ſhould exiſt. Stone was chiefly employed in the conſtruction of funeral erections of various kinds; nor are barrows wanting in Ireland, being hillocks of earth, thrown up in commemoration of the illuſtrious dead. Other monuments commonly ſtyled Druidic may alſo be found in Ireland; ſuch as ſingle ſtones erect, circular temples or rather places of judgment, and the like, which may more properly be aſcribed to the Belgic colony.* Antiquities.

* See Ledwich's introduction to Groſe's Antiquities of Ireland, for Cromlechs in the county of Carlow, and a cave in Meath.

 The

ANTIQUITIES.

The conversion of Ireland to Christianity was followed by the erection of a vast number of churches and monasteries, the latter being computed to exceed one thousand in number; but all these edifices were originally small, and constructed of interwoven withes, or hewn wood; for St. Bernard, in the twelfth century, mentions a stone church as a singular novelty in Ireland.

But the Scandinavian chiefs must before this period have introduced the use of stone into the castles, necessary for their own defence against a nation whom they oppressed; and sometimes even subterraneous retreats were deemed expedient, of which Ware and others have engraved specimens. To the Scandinavian period also belong what are called the Danes Raths, or circular intrenchments; and some chapels, such as those of Glendaloch, Portaferry, Killaloe, Saul Abbey, St. Doulach, and Cashel, if we may judge from the singularity of the ornaments, which however only afford vague conjecture. But of the round castles, called Duns in Scotland, and of the obelisks engraven with figures or ornaments, few or none exist in Ireland. Under the Scandinavians the Irish coinage first dawns.

Of the eleventh and twelfth centuries many monuments, castellated or religious, may probably exist in Ireland. Brian Boro, king of Munster, having been declared sovereign of Ireland in the year 1002, he distinguished himself by his virtues and courage; and Dermid III A. D. 1041—1073 was also an excellent and powerful prince. Under these monarchs and their successors, Tirdelvac and Moriertac, the power of the Ostmen or Scandinavians was considerably weakened. The native chiefs had been taught the necessity of fortresses, and were generally devoutly attached to religion; it is therefore to be inferred that many castles, churches, and monasteries now began to be partly constructed in stone by architects invited from France and England; but perhaps the round towers were erected by native builders.

The castles, churches, and monasteries, erected since the period of the English settlement might be counted by hundreds; and for them one general reference may be made to the works of Ledwich and Grose:

Grose: yet it is to be regretted that in collections of that kind the edifices are not arranged in the chronological order, as nearly as can be judged, of their erection. Among smaller reliques of antiquity, the golden trinkets found in a bog near Cullen, in the south, deserve mention: as gold was found in Gaul, they are perhaps ornaments of the ancient chiefs brought from that region. ANTIQUITIES.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Population.—Army.—Navy.—Revenues.—Political Importance and Relations.

RELIGION. THE legal religion of Ireland is the same as that of England; the same articles of belief being established, and the same orders of bishops, priests, and deacons composing the body of the Clergy, all of whom acknowledge the king as supreme head of the church. There are also similar ecclesiastical courts, but a convocation is never held even for the sake of form.

"The first preachers of Christianity in Ireland," observes Dr. Beaufort, "established a great number of bishoprics, which gradually coalesced into the thirty-two dioceses that have for several centuries constituted the ecclesiastical division of the kingdom. But when the country became impoverished and depopulated, by the perpetual feuds, and frequent civil wars with which it was desolated for ages; it was found necessary, at different periods, to unite some of the poorest of these sees, in order that the bishops might have a competence to support the dignity and hospitality incumbent on their station: and hence it comes that there are only twenty-two prelates in the church of Ireland, twenty sees being united under ten bishops. These causes having had the same operation with respect to parishes, the 2438 parishes do not form quite 1200 benefices, many having been consolidated by the privy council, from time to time, under the authority of an act of parliament; and many others, though but episcopally united, having been considered as only one living time out of

"of mind."* The consequence of this has been, that since the return of peaceful times, and the great improvement of agriculture, the value of Irish bishopricks and livings has become considerable, a few of the latter even exceeding 2000*l. per annum*. The large tracts of country, which many of these benefices contain, is such, that should the number of Protestants increase, a division of them will become necessary, as it is, in some instances, desirable at present. The bishops are lords of parliament; and four of them, in rotation, are members of the imperial legislature. RELIGION.

Ireland is divided ecclesiastically, as well as civilly, into four provinces; but the civil and ecclesiastical boundaries are far from coinciding. An archbishop presides over each, who has also his peculiar diocese. The seven bishops of the northern province are suffragans to the archbishop of Armagh, who is primate and metropolitan of all Ireland. The archbishop of Dublin is primate of Ireland, and has three suffragan bishops in the eastern province. The southern province, with its five suffragans, is under the jurisdiction of the archbishop of Cashel, primate of Munster. And the archbishop of Tuam, primate of Connaught, presides over the three bishops of the western province. These bishops are not even in form elected by the respective chapters, but are nominated by the king, and appointed under the great seal. The towns, from which many of the sees take their names, have not even a vestige of former consequence. The number of deaneries in Ireland is 33, and of archdeaconries 34. The archdeacons have not a visitatorial jurisdiction as in England, but the bishops hold a visitation annually, and the archbishops visit their suffragans every third year. The province of Armagh includes, besides the peculiar diocese of the archbishop, the sees of Meath, Kilmore, Dromore, Clogher, Raphoe, Down and Connor, Derry, and Ardagh. The last of these is now always joined to the archbishopric of Tuam. The province of Dublin, besides the archbishopric, contains the sees of Kildare, Leighlin and Ferns, and Ossory. The archbishop of Cashel unites in his own person the see of Emly, and has under him the bishops of Waterford and Lismore, Limerick and Ardfert, Killaloe and Kilfenora, Cork and Ross, and Ecclesiastical Geography.

* Beaufort's Mem. p. 104.

Cloyne.

ECCLESIASTICAL GEOGRAPHY.

Cloyne. Under the archbishop of Tuam are the fees of Clonfert and Killmacduagh, Killalla and Achonry, and Elphin.*

In Ireland the members of the eſtabliſhed church are far from being the moſt numerous claſs of the inhabitants. The Roman Catholics were ſuppoſed by ſir W. Petty, in the reign of Charles II, to be as eleven to two. Since that time the number of Proteſtants has conſiderably increaſed, eſpecially in Ulſter; and the Roman Catholics have, by many writers, been eſtimated at only about two-thirds of the whole population. In a late work, however, Mr. Newenham has given ſome reaſons for ſuppoſing they amount to four-fifths of the whole †. The penal laws eſtabliſhed in the reigns of Queen Anne and George I againſt this body were very intolerant; but it has been the wiſe and liberal policy of the preſent reign to remove ſuch grounds of complaint, and the Roman Catholics enjoy the fulleſt toleration in their religious worſhip, being under no reſtrictions, except excluſion from parliament, and from the higher offices of the ſtate. The hierarchy of this body is nearly ſimilar to the Proteſtant hierarchy; but the metropolitans and biſhops are conſidered by the Proteſtants as merely titular. They have been appointed hitherto by the Pope, generally on the recommendation of the leading men at home; but it is probable, from late circumſtances, that ſome change will take place in this reſpect. The metropolitans are ſtiled moſt reverend, and the biſhops right reverend, and they are uſually treated with reſpect both at court and by all claſſes of their fellow-ſubjects. The Catholic clergy were in former times educated abroad, and a conſiderable difference might be obſerved in their manners and information according to the foreign colleges at which they had reſided. At preſent the liberality of government has provided them with all requiſite advantages at home. They are chiefly taken from the middle claſs of ſociety, and are indefatigable in their exertions as clergymen. Their influence over the members of their church is however thought to be on the decline. Their ſalaries are in general very ſmall; and

* Beaufort Mem. 105, 106. The biſhop of Meath has precedence of all other biſhops, and next to him is the biſhop of Kildare. Young eſtimates the primacy at 8000*l.* a year, Derry at 7000; the other biſhoprics from 4000 to 2000, but great changes have taken place ſince he wrote. Young, vol. ii. 189.

† Newenham's Inquiry into the Population of Ireland, p. 297, &c.

thefe obtained with great difficulty, but their wants are comparatively few from the ftate of celibacy in which they live; and it is to their honour that they are very attentive to the diftreffes of their poor parifhioners. Befides the parochial clergy, there are feveral Friars of different orders in the large towns, who are fupported by voluntary contributions. The nunneries not only receive fuch ladies as chufe to fpend their lives in them; but alfo ferve for the education of young females of the Roman Catholic perfuafion.

Of the proteftant diffenters the prefbyterians are far the moft numerous; and though diffenters, they partake in fome degree of the nature and privileges of an eftablifhment. They are chiefly defcended from the Scotifh prefbyterians, and Englifh puritans whom James I encouraged to fettle in Ulfter. At firft their minifters were inducted into the churches and had the tithes, and, notwithftanding fome interruption from Lord Strafford, they retained thefe till Cromwell, irritated by their attachment to the king, and their refufal to comply with his orders, deprived them of the tithes, and gave them fmall falaries inftead of them. After the reftoration, Charles II, in confideration of their fufferings and of their loyalty, granted them a falary of 600*l.* a year to be divided amongft them. In the reigns of William III and George I the loyal bounty was augmented, and it has been repeatedly increafed in the prefent reign. The minifters are now divided into three claffes, of which the firft receive from government 100*l.*, the fecond 75*l.*, and the third 50*l.* a year each, in addition to the falaries given by their refpective congregations. No minifter can, however, receive the above fum, unlefs regularly admitted into a prefbytery, and approved by the lord lieutenant. The prefbyterian form of church government is in fome degree retained, and the minifters of nearly all the prefbyteries meet together annually in the fynod of Ulfter, in which all the general concerns of the body are difcuffed. The number of the prefbyterians is eftimated at half a million by thofe who are beft acquainted with the part of the kingdom where they chiefly refide. Since the repeal of the teft act, they are free from all thofe reftrictions to which the diffenters in England are fubject, and have no object to purfue diftinct from the general welfare of the community. The quakers are a numerous and

refpectable

Ecclesiastical Geography.

respectable body, but are generally deserted by those who become wealthy, from an unwillingness to comply with their strict regulations. The other classes of protestant dissenters are few in number, unless we include the methodists. These consider themselves as members of the established church, and their clergy do not attempt to administer baptism or the Lord's supper. They have, however, separate places of worship, and they appear to increase rapidly in all parts of Ireland.

As the principal causes of discontent have been removed, and as all these sects possess in common, many valuable privileges, it is their interest, as well as duty, to live in harmony with each other; and to promote this harmony will be the endeavour of every man who sincerely desires the prosperity of the united kingdom. That this opinion gains ground more and more, affords a happy omen of future tranquillity.

Government.

The Government of Ireland was constructed upon the plan of that of England, being vested in a house of commons, and another of peers, while the king was represented by a lord lieutenant or viceroy. But no act of importance was considered as valid, till it received the sanction of the king and council of Great Britain. This continued till the year 1782, when the independence of Ireland was acknowledged, and the interference of the English council no longer allowed. At present, in consequence of the union, the form of government is identically the same in both countries. Ireland is represented in the imperial parliament by twenty-eight temporal and four spiritual peers, the former of whom are elected for life; and by a hundred commoners, who are chosen by the counties and principal towns. A vice-regal court is still maintained in Dublin, and there is a separate board of treasury for Ireland, as well as boards for the collection and management of different branches of the revenue. There is also a privy council to assist the lord lieutenant, the members of which have the same privileges as in England. The judges and courts of law have the same names; but there are some minute variations between the statute and common law of Ireland and those of England. Besides the assizes, which are held twice a year, there is in every county of Ireland, except that of Dublin, an inferior judge called an assistant barrister, whose business it is to sit, at least twice every year, in the most convenient parts of

of the country, to try civil bills, for the more ſpeedy adminiſtration of juſtice. GOVERNMENT.

The population of Ireland has been variouſly ſtated. Many contend that it does not exceed three millions, whilſt others ſtate it to be above five millions. As the number of houſes, according to the official return in 1791, was above 700,000, allowing ſix inhabitants to each houſe, it would exceed four millions, which is probably much below the real number. When it is conſidered that, in 1695, the population was little more than a million, this increaſe appears prodigious, and almoſt incredible. It may, however, be eaſily accounted for from the progreſſive improvement in agriculture and manufactures, from the mildneſs of the climate, from the abundance and convenience of fuel, and from the habits of the people, who, content with ſimple food, are plentifully ſupplied with a wholeſome and cheap ſuſtenance in that invaluable root the potatoe, and who are not deterred from early marriages by the fear of want. The abolition of the penal laws has alſo increaſed the population, by keeping at home the vaſt numbers who formerly engaged in the ſervice of the continental powers.* Numerous emigrations have taken place from Ireland to America, and the various Britiſh ſettlements; but no ſeparate colony of Iriſh has been founded. Population.

Beſides large contributions to the Britiſh army, Ireland in 1780 raiſed upwards of 40,000 volunteers, and has recently equipped a conſiderable militia and yeomanry. If we ſuppoſe every eighth perſon capable of arms, Ireland might raiſe a force of about 500,000 men. Of mariners, Ireland contributes a reſpectable proportion, and many naval officers from this part of the united kingdom have diſtinguiſhed themſelves by their ſkill and courage. Army. Navy.

The public revenues of Ireland were computed by an intelligent traveller† at about one million ſterling: or 6s. 8d. a head, when thoſe of England ſtood at 1l. 9s. This was in the year 1778, and great changes have ſince taken place. In 1784 the national expenditure, according to Lord Sheffield, was 1,098,184l., and the whole debt funded Revenues.

* Beaufort's Mem. p. 142. Buſhe in Tranſactions Iriſh Acad. vol. iii. Newenham's Inquiry into Population of Ireland paſſim. The laſt writer enters much into detail, and produces many important documents.

† Young's Tour in Ireland.

REVENUES. and unfunded 2,179,208l.* In the year ending 5th January 1805, according to an account laid before the houſe of commons, the ſum raiſed for Ireland exceeded ten millions, of which 4,729,406l. was the net produce of the ordinary revenue, and the reſt was procured by a loan. The national debt of Ireland was at that time 53,296,356l. 15s. By the terms of the union, Ireland pays $\frac{2}{17}$ of the general expences of the empire, and this ſum in the ſame year amounted to 5,081,474l.† As a great proportion of the inhabitants of Ireland are unable to pay aſſeſſed taxes, and as numbers of thoſe having large eſtates reſide entirely in England, it can no longer be ſaid, that the taxes are not materially felt.

Political Importance and Relations. With regard to the political importance and relations of Ireland, they would undoubtedly be great; but their weight has fortunately never been felt apart from thoſe of England. The confuſed ſyſtem of the old native government almoſt prevented Ireland from being conſidered in the ſcale of European ſtates; and ſince the introduction of a more civilized ſcheme, ſhe has been indiſſolubly attached to England. Monteſquieu has juſtly regarded it as a radical error in the politics of Louis XIV, that when he ſent troops to Ireland to reſtore James II, he did not ſeize the opportunity of eſtabliſhing a firm conqueſt of the iſland, which would eventually have proved of more ſolid advantage to France than all their idle plans of ambition, if they had even been realized. The great maſs of the people of Ireland being catholics, one of the ſtricteſt bonds which can unite nations was already formed; and the numerous ports of Ireland might, under the conduct and ingenuity of the French, have ſent forth numerous fleets, and have aſſiſted their ally to balance the naval power of England. But happily for Great Britain that opportunity was for ever loſt. After the great preponderancy which the Britiſh have now held at ſea, for more than a century, it is inconceivable that Ireland, an adjacent iſland, could have remained a ſeparate ſtate, without the ſpecial and previous conſent of England. Her commerce would have been totally at the command of her rival, and any riſing fleet of war would have been cruſhed in the very bud. If the

* Sheffield on the State of Ireland, p. 343, &c.

† Official returns to the houſe of commons in May and June 1805.

English armies could have been withstood, still Ireland must have been restricted to her native produce, and the most innocent foreign luxuries must have been totally interdicted; nor to a candid and impartial observer would it appear that Ireland could attain any solid advantages by this *impossible* independence. Suppose an alliance formed with France, it must, at least for a long time, have continued an alliance of dependence; and to those who consult the real business of states, and not learned theories, which are very foreign from business, it must occur that this pretended alliance must soon have terminated either in the subjugation of Ireland by France, or a return to the connection with England, which would have been faciliated by an English party which would naturally exist in great force, and be continually increased by those who were malcontent at the French interpositions and usurpations. The political importance and relations of Ireland are therefore intimately blended with those of England; while the western position of the former imparts singular advantages in the commerce with America and the West Indies.

POLITICAL IMPORTANCE, &c.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs. — Language. — Literature. — Education. — Universities. — Cities and Towns. — Edifices. — Inland Navigation. — Manufactures and Commerce.

MANNERS AND CUSTOMS.

SPENSER the poet, in his view of the ſtate of Ireland, has preſerved ſeveral curious particulars concerning the national manners in the reign of Elizabeth. As that work, though ſanctioned by an illuſtrious name is little read, two ſpecimens ſhall be tranſcribed, one concerning what were then termed the Iriſh horſe-boys; and the other giving ſome account of the bards. After deſcribing the ſavage manners of the Gallow-glaſſes or infantry, and the Kernes or predatory cavalry, that venerable writer thus proceeds:

" And now next after the Iriſh kerns, methinks the Iriſh horſe-boys would come well in order: the uſe of which though neceſſity (as times now be) do enforce, yet in the thorough reformation of that realm they ſhould be cut off. For the cauſe why they are now to be permitted, is want of convenient inns for lodging of travellers on horſeback, of and oſtlers to tend their horſes by the way. But when things ſhall be reduced to a better paſs, this needeth ſpecially to be reformed. For out of the frie of theſe rake-hell horſe-boys, growing up in knavery and villany, are their kern continually ſupplied and maintained. For having been once brought up an idle horſe-boy, he will never after fall to labour, but is only made fit for the halter. And theſe alſo (the which is one foul overſight) are for the moſt part bred up amongſt the Engliſhmen; of whom learning to ſhoot in a piece, and being made acquainted with all the trades of the Engliſh, they are afterwards, when they become kern, made more fit to cut their throats. Next to this there is another much like, but much more lewd and diſhoneſt, and that is of their Carrows, which is a kind of people

people that wander up and down to gentlemen's houſes, living only upon cards and dice; the which, though they have little or nothing of their own, yet will they play for much money; which if they win, they waſte moſt lightly; and if they loſe, they pay as ſlenderly, but make recompence with one ſtealth or another: whoſe only hurt is not that they themſelves are idle loſſels, but that through gaming they draw others to like lewdneſs and idleneſs. And to theſe may be added another ſort of like looſe fellows, which do paſs up and down amongſt gentlemen, by the name of jeſters, but are (indeed) notable rogues, and partakers, not only of many ſtealths, by ſetting forth other men's goods to be ſtolen, but alſo privy to many traitorus practices, and common carriers of cows." MANNERS AND CUSTOMS.

After delineating the diſſolute life of an Iriſh chieftain, Spenſer thus introduces the Bards:

"In which if he ſhall find any to praiſe him, and to give him encouragement, as thoſe Bardes and Rithmers do, for little reward or a ſhare of a ſtolen cow; then waxeth he moſt inſolent, and half mad with the love of himſelf, and his own lewd deeds. And as for words to ſet forth ſuch lewdneſs it is not hard for them to give a goodly and painted ſhew thereunto, borrowed even from the praiſes which are proper to virtue itſelf. As of a moſt notorious thief and wicked outlaw, which had lived all his life time of ſpoils and robberies, one of their Bardes in his praiſe will ſay, that he was none of the idle milk-ſops that was brought up by the fire ſide, but that moſt of his days he ſpent in arms and valiant enterpriſes; that he did never eat his meat before he had won it with his ſword; that he lay not all night ſlugging in a cabbin under his mantle, but uſed commonly to keep others waking, to defend their lives, and did light his candle at the flames of their houſes to lead him in the darkneſs; that the day was his night, and the night his day; that he loved not to be long wooing of wenches to yield to him, but where he came he took per force the ſpoil of other men's love, and left it lamentation to their lovers; that his muſic was not the harps, nor lays of love, but the cries of people, and claſhing of armour; and finally that he died not bewailed of many, but made many wail when he died that dearly bought his death."

Spenſer,

MANNERS AND CUSTOMS.

Spenser, an excellent judge, then observes that he had caused several compositions of the bards to be translated, "and surely they savoured of sweet wit, and good invention, but skilled not of the goodly ornament of poetry; yet were they sprinkled with some pretty flowers of their natural device, which gave good grace and comelineſs unto them; the which it is great pity to see so abused to the graceing of wickedness and vice, which with good usage would serve to adorn and beautify virtue."

The manners of the superior classes of people in Ireland now nearly approach to the English standard, except that excess in wine, unfashionable in England, continues to prevail too much in the sister island. The Irish gentry are also seldom addicted to literature or the arts; but amuse themselves with hunting and other robust exercises. Hence an overflow of health and spirits; and the observation of an able writer, that Ireland produces the stoutest men, and the finest women in Europe, must not be confined to the inferior classes.

The manners of the middle class are however very different from those of the English, and they have been well described by Dr. Crumpe in his *Essay on the best means of providing employment for the people.* "This class," says he, "is principally composed of men of small estates, "who generally live beyond their income; and those landholders, known "by the name of *middle men*, who take large districts of the country from "those possessed of extensive estates, and either cover them with black "cattle and sheep, or re-let them at extravagant rents to wretched and "indigent cottagers. The general characteristics of this class are dissipa-"tion, idleness, and vanity. Every man, with a few acres of land, and "a moderate revenue, is dignified, as a matter of course, with the title "of Esquire; and be his family ever so numerous, the encumbrances "on his little property ever so considerable, he must support a pack of "hounds, entertain with claret, or if not able, with whiskey, keep "a post-chaise and livery servants, and ape, in short, his superiors in "every respect.* Meanwhile his debts are increasing, his creditors

* Since this was written in 1793, the taxes on carriages, male servants, and dogs, the increased price of foreign wines, and the encouragement given to agriculture have all contributed to lessen the evil here described.

"growing

" growing clamorous, and every induſtrious occupation which might " relieve his diſtreſſes neglected, as utterly beneath the dignity of a " Gentleman. To the ſame ſource are we to trace thoſe nuiſances to " every rank of ſociety denominated *bucks*, and *buckeens*. Such in " general are either the eldeſt ſons of gentlemen of ſmall property, or the " younger children of thoſe of larger, who have received their ſcanty " pittance, of which the augmentation by induſtrious means is never " once attempted, and the final diſſipation, one would imagine, deemed " impoſſible. To ſtand behind a counter, ſuperintend a farm, or " calculate in a compting-houſe, would be beneath the dignity of ſuch " exalted beings, and diſgrace the memory of their gentlemen anceſtors. " To the ſame general averſion to induſtry, and tendency to diſſipation, " and to a conſiderable ſhare of family vanity, are we to aſcribe the " ſilly, but more excuſable propenſity of gentlemen to educate their " children in gentlemanly profeſſions. Hence ariſe the daily increaſing " number of curates with ſcanty ſalaries, or none, attornies preying on " the public, enſigns without the means of riſing higher, phyſicians " without patients, and lawyers without briefs."* With reſpect to the mercantile and trading part of the community, they do not poſſeſs the ſpirit of induſtry and application to buſineſs, in as great a degree as thoſe of the ſame deſcription do in England; and they are much too apt to retire from buſineſs when their capitals begin to be ſuch as to enable them to carry it on advantageouſly. Theſe do not poſſeſs the unthinking ſpirit of extravagance which ruins the Iriſh gentlemen, yet they too frequently live up to, or beyond their profits, and bankruptcy is oftener the effect of this mode of living than of hazardous ſpeculations. " Two leading and naturally allied features in the character of the lower " Iriſh are idleneſs and inquiſitiveneſs, eſpecially when hired and em- " ployed to perform the work of others. The moment an overſeer " quits them, they inevitably drop their work, take ſnuff, and fall into " chat as to the news of the day; no traveller can paſs them without " diverting their attention from the buſineſs in hand, and giving riſe " to numerous ſurmiſes as to his perſon, errand, and deſtination. The

* Crumpe's Eſſay, 179—183.

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MANNERS AND CUSTOMS.

" moſt trivial occurrence, eſpecially in the ſporting line, will hurry " them, unleſs reſtrained, from their occupations. A tendency to " pilfering and theft is very predominant among them, and connected " with this is the prevalence of low cunning and lying; and, as their " accompaniment, may be mentioned a fawning flattery. The blunt " honeſty, the bold independence of the Engliſh yeomen are wanting; " and in their place, too generally ſubſtituted the petty diſhoneſty of " the vaſſal, the ſervility and artifice of the ſlave. Drunkenneſs is an " evil of conſiderable magnitude in the catalogue of national vices. It " is one to which the lower Iriſh are peculiarly addicted, and that " from which the moſt ſerious obſtructions ariſe to their induſtry and " employment. That vile beverage, *whiſkey*, ſo cheaply purchaſed, " and ſo generally diffuſed, affords them an eaſy opportunity of grati- " fying this deſtructive paſſion. As one conſequence of the general " prevalence of ebriety, the lower Iriſh are remarkably riotous. Their " fairs are frequently the ſcenes of confuſion, diſturbance, and blood- " ſhed. Combinations, riſings, and outrage among tradeſmen are far " from unuſual, and on pretexts that are truly ridiculous.* They are " alſo, to a remarkable degree, lawleſsly inclined. Inſtead of being " anxious to apprehend offenders, or to aſſiſt the execution of the law, " they are, in general, ready to give the former every aſſiſtance to " eſcape; and to reſiſt the latter, unleſs awed by ſuperior force."[3] The motive for thus mentioning the defects of the national character of the Iriſh, is to excite attention to the mode of remedying them. Sir John Davies and Mr. Young, both intelligent Engliſhmen, who had means of inveſtigating the ſubject, have traced them to oppreſſion. This originated with the native chieftains, and was continued by the Engliſh coloniſts; and to it many of the leading traits in the preceding character may eaſily be traced. " Extortion and oppreſſion," as Sir John Davies ſays, " have been the true cauſe of the idleneſs of this Iriſh nation." Oppreſſion is univerſally the parent of idleneſs, eſpecially

* Many valuable branches of trade have been completely deſtroyed, or at leaſt conſiderably injured by the combinations of the tradeſmen, to raiſe their wages whenever there is a demand for their ſervices; and neither the rigour of the law, nor the ſufferings they have brought upon themſelves, have yet removed this evil.

[3] Crumpe.

when

when accompanied by exaction and rapacity; both have existed to an enormous degree in Ireland, and both, though considerably diminished, still exist.[3] Whoever will take the trouble of tracing the bad qualities enumerated to their source, and considering the favourable changes of which they are susceptible, will not hesitate to admit that the Irish are capable of being rendered as useful citizens, and as valuable subjects as any upon earth. This is to be effected by patient culture, by a prudent conjunction of coercion and conciliation, by an uniformly impartial administration of distributive justice, by introducing an improved system of education, by promoting habits of industry, and by involving their interests in the interests of the empire.[4] To counterbalance the defects that have been stated, there are innumerable good qualities; though these partake more of the energy of courage, the warmth of patriotism, and generosity of hospitality than the cool, considerate, and prudent perseverance of industry.[5] "Every unprejudiced traveller," says Mr. Young, "who visits Ireland will be as much pleased with the cheerfulness "as obliged by the hospitality of the inhabitants, and will find them "a brave, polite, liberal, learned, and ingenious people." The courage of the Irish has, indeed, been ever esteemed by foreign nations who knew how to take advantage of the bad policy of the English government. Whole regiments were formed under the name of Irish brigades, and the siege of Cremona was not the only event in which Irish bravery was conspicuous. Instead, however, of strengthening our enemies, the Irish now serve in the British fleets and armies, and have had their share in the glorious victories which have sustained the dignity and independence of the empire.

MANNERS AND CUSTOMS.

In passing through Ireland a stranger will be struck by the crowds that attend funerals, and by the cries of the mourners, though these are less frequent than they used to be. The diet of the peasantry consists chiefly of potatoes and milk, which is found to be very wholesome and

[3] Crumpe's Essay, 207, &c.

[4] Newenham on Population.—A lively description of the manners of the country squires and lower classes of Ireland will be found in a late novel entitled "Castle Rackrent;" but the characters described are becoming every day less common, and are, perhaps, from the nature of the work, exaggerated.

[5] Crumpe, p. 189.

Manners and Customs.

nourifhing; and their habitations, efpecially in the fouth, are often only wretched hovels of mud. Fine healthy children run out in a ftate of nature to gaze upon the paffing ftranger, and the drefs of the parents is contrived for warmth, not for ornament. The men in particular are remarkable for a large outfide coat, hung on their fhoulders, which they retain, except when at work, in the moft fultry weather. In former times, a ftriking feature of national drefs was a puckered fhirt, confifting of 40 or 50 yards of linen dyed with faffron, which was regarded as an effectual antidote againft vermin, but this cuftom is now only known from the refearches of the antiquary. The amufements of the upper claffes are fimilar to thofe of the fame rank in England; but thofe of the common people have many fhades of difcrimination, for inftance, the wake that precedes a funeral is a grand fource of joy and amufement.*

Language.

The Englifh language daily gains ground in Ireland, and might, if proper attention had been beftowed on the national education, have become ere now the general idiom of the country. The ancient Irifh is, as is well known, a dialect of the Celtic intermingled with many Gothic words, imported by the Belgic colonies, by the Scandinavians, and by the Englifh. Ireland being the laft retreat of the Celts, and of confiderable population, the language may be fuppofed to prefent the moft numerous and genuine fpecimens of the Celtic denomination. The ancient lives of the faints have preferved many Irifh terms, as remote as the fixth and following centuries; and fragments of pious tranflation defcend even to the tenth century. The moft venerable remains are the annals of Tighernac, and other writers, of the eleventh and fucceeding centuries; and it is unaccountable that thefe valuable records have not been laid before the public in their original tongue, accompanied with a Latin or Englifh interpretation. The calligraphy of the Irifh manufcripts is fo fimilar in every age, that it becomes extremely difficult, even for the antiquary, to difcriminate the precife century in which any one was written; but there do not feem to be fufficient

* Mr. Young, ii. 229, obferves that the Spaniards had a kind of fettlement on the coaft of Kerry; nor were they expelled till Cromwell's time. The Scotch in the north are ftill a very diftinct race.

grounds to aſcribe any now extant to a more remote period than the twelfth or thirteenth century. LANGUAGE.

The Lord's prayer in the Iriſh idiom runs in the following terms:

Ar nathair ata ar Neamh. Naombthar Hainm. Tigeadh do Rioghachd. Deuntar do Thoil ar an Ttalámh mar do nithear ar Neamh. Ar naran la athambail tabhair dhúinn a niu. Agus maith dhúinn ar Bhfiacha mar mhaithmidne dar bhfeitheamhnuibh fein. Agus na léig ſinn a cathughadh. Achd ſáor ſinn o Olc. Amen.

The literature of Ireland has a venerable claim to antiquity; for, as has been already mentioned, in the centuries immediately following the introduction of Chriſtianity many writers aroſe, whoſe works were not indeed adapted to the popular taſte, as they conſiſt of lives of ſaints, and works of piety and diſcipline, but to the inquiſitive reader they preſent many ſingular features of the hiſtory of the human mind. Thoſe of the firſt deſcription are commonly remarkable for a ſuperabundance of miracles, which are but frugally diſtributed in the other European lives of ſaints. But the national manners, and the peculiar character of the times, are juſtly delineated, as in the fragments of a broken mirror. The chief glory of the ancient Iriſh literature ariſes from the repulſion of the rays of ſcience, after it had almoſt periſhed in Europe, on the fall of the Roman empire in the weſt. The Anglo Saxons, in particular, derived their firſt illumination from Ireland; and in Scotland literature continued to be the ſpecial province of the Iriſh clergy, till the thirteenth century. Literature.

A moſt ingenious and reſpectable writer of the laſt century[6] has publiſhed a ſmall volume, containing a chronological catalogue of Iriſh authors, from about the year 450, to his own time, containing about two hundred names; the tenth century, as uſual in European literature, being the moſt barren, whence it is ſtyled by literary men the dark century. The illuſtrious names of Uſher and Ware have been followed by a long train of eminent ſucceſſors;[7] learning has ripened into genius, and all Europe acknowledges the ſuperior talents

[6] Sir J. Ware Script. Hibern.

[7] Amongſt theſe we find the names of Swift, Parnell, Congreve, Sterne, Goldſmith, King, and Berkeley.

LITERATURE.

of a Burke and of a Sheridan. The late lamented Earl of Charlemont set a distinguished example of the union of rank and literary fame, which it is hoped will be followed by other dignified persons, to the exclusion of low or boisterous relaxation. In some departments of science Ireland begins to resume her ancient prerogative of reflecting light to Britain; and the name of Kirwan stands almost alone in mineralogy, a branch highly important to the prosperity of nations, but unaccountably neglected in the land of tin.

Education.

In no quarter of the British dominions, has education been conducted upon a more solid and rational plan than in Scotland: and no where has it been till of late, more neglected than in Ireland. It is to be hoped that one consequence, and not the least important, of the Union, will be the introduction of parochial education into Ireland, a sure mean of preventing the ebullitions of ignorant discontent, arising often some erroneous views of human life and happiness, and from the weakness of uninformed fanaticism. Those who may justly distrust theory in any political question, may here find the evidence of facts; and may compare the turbulence of the Irish with the peaceable demeanour of the Scotish Highlanders, a congenerous people. But though a system of education is wanting in Ireland which shall extend to all the poor, and though the schools now existing have many defects, which require correction, yet it is not to be supposed that there are few or no schools for the poor in Ireland. On the contrary, the charter schools, Erasmus Smith's schools, the foundling hospitals at Dublin and Cork, and others, receive above 7000 children, who are clothed, fed, and instructed in the protestant religion. There are many other protestant schools in which the children are merely educated, and in some of them great attention is paid to form habits of industry. Besides these, schools have been instituted in which protestant and Roman catholic children mix together without any attempt to influence their religious faith. The Roman catholics also have charity schools at which numbers of poor children are instructed; and such is the desire of information, that there is not a village, especially through the south, where there is not a schoolmaster, who, in a small cabin, or under a hedge by the road side, teaches the children of it, the parents gladly paying him out of their

little earnings. The progreſs that many of theſe poor ſcholars often make in Arithmetic and Geometry is ſuch as ſeems ſcarcely credible to thoſe who have not witneſſed it; and mathematical works of high price are eſteemed and purchaſed by thoſe who live on potatoes and milk, and are clothed in rags. The attention of many eminent characters has been directed to the improvement of education, and if more progreſs has not been made it has been in conſequence of the difficulty ariſing from the different ſects of which the population is compoſed. EDUCATION.

With four Archbiſhoprics Ireland only poſſeſſes one proteſtant univerſity, that of Dublin.[1] This inſtitution was firſt projected by Archbiſhop Leech, about the year 1311; but death having interrupted his deſign, it was revived and executed by Bicknor his ſucceſſor, and enjoyed moderate proſperity for about forty years, when the revenues failed. In the reign of Elizabeth the univerſity was refounded by voluntary contribution, under the auſpices of Sydney the Lord Deputy. In 1591 it was removed from the precincts of St. Patrick's church to the ſite of an Auguſtine monaſtery; and received a charter from Elizabeth under the ſtyle of Trinity college. The firſt James and Charles were liberal benefactors. It conſiſts of a chancellor, vice-chancellor, provoſt, vice-provoſt, twenty-two fellows, and thirteen profeſſors of various ſciences. The number of ſtudents is commonly about ſix hundred, including ſeventy ſcholars on the foundation and 30 ſervitors or ſizers. To make advancement the reward of exertion is the prevailing principle in this univerſity. Admiſſion into it is only allowed to thoſe who on examination appear to have improved themſelves at ſchool. Scholarſhips are given to the beſt claſſical ſcholars who have arrived at their third year, and entitle the poſſeſſors to a ſmall annual income, and to a place in the corporate body. The more lucrative, and honourable ſituation of a fellow is only obtained by many years of hard labour, and by being ſuperior to other candidates on a long and very difficult examination. Quarterly examinations are alſo held for the undergraduates, and premiums given to the moſt diſtinguiſhed anſwerers, the good effects of which are viſible in the exertions of the ſtudents. The building conſiſts of three quadrangles; and it contains a library of great extent and value, Univerſities.

[1] Gough's Camden, ii. 555.

which

UNIVERSITIES.

which has been lately enriched by the celebrated Fagel collection from Holland. There are alſo a hall for examinations, a chapel, a printing office, and convenient theatres for the different lectures. Adjacent is a park; and an obſervatory has been lately erected on the calcareous rock of Dunſurk, about four miles to the N. W.*

In the year 1795 the Parliament of Ireland, juſtly ſenſible of the evil ariſing from the Roman Catholics being obliged to reſort for education to foreign countries, eſtabliſhed the Royal college of St. Patrick at Mayrooth, a ſmall town about 12 miles from Dublin, under the occaſional ſuperintendence of a reſpectable board of truſtees, and governed by a preſident. There are ſeven reſident profeſſors, and a proviſion for the education of young men for the Romiſh church. The Roman Catholics have alſo a lay college at Mayrooth eſtabliſhed by private ſubſcriptions in 1802, and a college for the education of prieſts at Carlow.

There are many endowed ſchools in Ireland of which that at Kilkenny is one of the beſt. The incomes of the maſters are in ſome inſtances however ſo great from the increaſed value of lands as to defeat the intended benefit. The education of the higher and middle ranks is as much attended to as in England, and ſchools of all deſcriptions are rapidly improving.

Dublin Society.

The Dublin Society for the improvement of agriculture and manufactures was inſtituted by the efforts of the patriotic Dr. Samuel Madden in 1731, being the earlieſt of the kind now exiſting in Europe.† The object of this ſociety is to connect ſcience and art, and to direct their united efforts to the improvement of agriculture, manufactures, and commerce, and to the increaſe of domeſtic comforts. Public lectures on Chemiſtry, on Botany, on natural philoſophy, and on the veterinary art have been inſtituted; models of implements of agriculture and of improved machinery for manufactures have been procured; ſchools of architecture, landſcape, ornament and figure drawing have been eſtabliſhed; and annual premiums are given to reward ingenuity and encourage attention to the objects of the ſociety. A botanic garden has been

* See an account of this obſervatory in the Tranſactions of the Royal Iriſh Academy, vol. i. p. 23.

† Young, ii. 210.

made

made at Glefnevin near Dublin, including above 27 Englifh acres which is laid out in a peculiarly inftructive manner. The Lefkean collection of minerals has alfo been purchafed by the fociety. This was formed by Lefke one of the earlieft and moft diftinguifhed pupils of the celebrated Werner. It was afterwards revifed, enlarged, and defcribed by Karften, and has fince been even more rigoroufly examined by Kirwan. The whole collection contains 7331 fpecimens, and is one of the moft perfect monuments of mineralogical ability now extant. It is placed in a large room fitted for the reception of ftudents, and in adjoining apartments are the minerals of Ireland, and fuch others as the fociety is continually adding to the collection.* DUBLIN SOCIETY.

Dublin, the capital city of Ireland, feems to be the Eblana of Ptolemy; but continued little known till the tenth century, when it was mentioned in the Saxon chronicle; and in the beginning of the next century, we have coins of Canute ftruck at Dublin. The fituation is delightful, in a bottom, between ranges of hills on the fouth and north. It is pervaded by the river Liffy, and by fome rivulets. The inhabitants have been eftimated at 170,000; this capital being juftly accounted the fecond in the Britifh dominions, and the fifth in the fcale of European cities.* Cities Dublin.

The circumference of Dublin may be about ten miles, being about two miles and a quarter in length, and as much in breadth. The harbour is incommodious, being impeded with two banks of fand, called the north and fouth bulls, which prevent fhips of large burden from paffing the bar; but fome improvements have been made, and others might be carried into execution. A mole has been conftructed four miles in length; and the quays are fpacious and beautiful. There are fix bridges, the chief of which is that called Carlifle. The houfes were anciently conftructed of wattles daubed with clay. In Elizabeth's time they ufed timber in the Flemifh fafhion; and brick and ftone were feldom introduced till the laft century. The caftle was founded about the year 1205, but has been fince rebuilt, and is now the town refidence of the Viceroy, and the fanctuary of the public records. The parliament

* Tranfactions of Dublin Society.

* Gough's Camden, iii. 534. 538. Whitelaw on population of Dublin.

houfe,

Cities. house, a superb building, erected at considerable expense has been purchased for a national bank. The church of St. Patrick is the cathedral, a venerable building, which was begun in the end of the twelfth century; but the steeple, the highest in the city, was not erected till the year 1370. The other churches are twenty in number, several of which are elegant modern erections. The Royal Exchange was compleated in 1779; and among other beautiful edifices must not be omitted that whirlpool of expenditure the Custom House; the new four courts and the houses of the Duke of Leinster, the Earl of Charlemont, and others.

Dublin has an ample supply of native provisions; but coals are imported from Scotland and Cumberland.

The environs of Dublin present many pleasant views, and remarkable objects. St Stephen's Green is an English mile in circumference, laid out in walks, and planted with trees, in 1670, with an equestrian statue of George II by Van Nost in the centre. The Phœnix park is the Hyde park of Dublin, and contains the country residence of the Viceroy. Many seats of the nobility and gentry decorate the vicinity of Dublin. The hill of Howth is a peninsular promontory, which forms the north-east side of the bay of Dublin; and about three quarters of a mile to the north is Ireland's eye, a small rocky isle. Lambay is a larger island near the shore, full of rabbits, and sanctified by a holy well. Dalkey is a romantic village at the northern base of a mountain, six miles and a half from Dublin: but amongst the most pleasant places in the vicinity, are Lucan where there is a sulphureous spring, much visited in the summer season, and Leixlip, a noted salmon-leap, so called from these fish darting up the cataract. Swords, six miles to the north, presents a very complete round tower, seventy-three feet in height; and about a mile beyond Kilternen is a remarkable chasm, called the Scalp; in the ridge of a mountain, appearing as if that part had been undermined, and had fallen in.

Cork. In proceeding to give a brief account of the principal towns and cities of Ireland, Cork and Limerick attract the first attention. Cork is a city of considerable importance, situated on the south east side of the island, and supposed to contain about 80,000 inhabitants. The haven ranks

ranks among the moſt capacious and ſafe in Europe; and the paſſage from it to the city is remarkable for the variety, and beauty of the ſcenery. The exportation, the largeſt in the ſiſter iſland, conſiſts chiefly of beef, pork, hides, tallow, and butter. It is the grand market of Iriſh proviſions; and it was computed that no leſs than an hundred thouſand cattle were here annually killed and ſalted, between the months of Auguſt and January.[11] The proviſion trade is however on the decline; and the export of corn has become conſiderable. The breweries and diſtilleries of Cork are numerous and extenſive. One porter brewery alone delivers above 100,000 tierces annually, and the liquor is held in ſuch high eſtimation that it is preferred to any other, in the Weſt Indies. This city lies chiefly in a marſhy iſland, ſurrounded by the river Lee; but the marſhes on the oppoſite ſide of the river having been drained, ample ſpace has been given to the recent improvements.* Cities. Cork, &c.

Limerick unites the fortunate ſituation of being almoſt central to the ſouth of Ireland, with an excellent haven, formed by the long eſtuary of the river Shannon. The city is accounted the third in Ireland, and was formerly fortified with great care. The epiſcopal ſee is ſaid to have been founded in the year 652. The Danes held the city from the ninth century to the eleventh. There are three bridges over the river, one of which conſiſts of fourteen arches. The number of inhabitants has been computed at 50,000. This is a very improving city in every reſpect in conſequence of the extenſive communication it has by the Shannon, and the grand canal, with the interior parts of the country. It has an export of beef, pork, and butter, but its chief trade is in grain, of which larger quantities are ſent from this, than from any other port of Ireland.[12] Limerick.

The other chief towns in Ireland ſhall be briefly mentioned, in a geographical progreſs from the ſouth towards the north.

Galway is a town of conſiderable note, and carries on an extenſive trade with the Weſt Indies. The port is commodious and ſafe, but Galway.

[11] Gough's Camden, iii. 504.

* Mr. Young, vol. i. 417, expreſſes his aſtoniſhment at the populouſneſs of Cork. The duties of the harbour were, in 1751, 62,000l.: in 1779, 140,000l.

[12] Gough's Camden, iii. 517.

 diſtant

Cities. Galway.

diſtant from the city, which can only be reached by veſſels of ſmall burden: the number of inhabitants is computed at 12,000. Greater trade is now carried on in the bay of Sligo than at Galway.[13]

Weſtport.

On Klew bay, in the centre of the weſt of Ireland, ſtands Weſtport which has been increaſing under the auſpices of the Marquis of Sligo; but by ſome fatality the advantages of the county of Mayo, have not been improved, nor are there any towns of much consequence upon the whole weſtern coaſt. Sligo is, however, increaſing in trade, and the inhabitants are computed at 8000: and Caſtlebar is alſo a proſperous town.[14]

Sligo.

Londonderry.

Londonderry is more remarkable for its ancient and military fame than for its preſent commerce, though not unimportant. It ſtands on the river Foyle, over which a wooden bridge of ſingular conſtruction, one thouſand and ſixty-eight feet in length, was thrown in 1791.

Belfaſt.

Belfaſt on the North-eaſt is in the centre of the linen manufactures, and may almoſt be regarded as a Scotiſh colony. The inhabitants are computed at 20,000. The chief manufactures, cotton, cambric, ſail-cloth, linen, with glaſs, ſugar, and earthenware. It maintains conſiderable intercourſe with the commercial city of Glaſgow; and the grand exports are to the Weſt Indies.

Newry.

Newry on a ſmall ſtream which flows into the bay of Carlingford is the ſecond of the northern towns. Its butter trade amounts to above 300,000l. annually; and the linens exported from it from January 1802 to 1803 amounted to 200,000l. The average of the weekly ſales in the linen market is eſtimated at 4500l. A canal extends from Lough Neagh, by Newry, to the ſea. Carling bay is remarkable for oyſters.

Dundalk.

Dundalk has alſo its manufactures of linen and muſlin. Drogheda imports ſea-coal and goods from England, and exports conſiderable quantities of grain. It is a well built town on the Boyne; the inhabitants on enumeration in 1798 were found to exceed 15,000.

Wexford.

Towards the South-eaſt, Wexford claims the firſt notice, being remarkable for its woollen manufactures; but the haven, though ſpacious, is not ſufficiently deep for large veſſels. The inhabitants are 9000.

[13] Beauf. 9. [14] Beauf. 72. Young, i. 291.

New Rofs, fituated on the river Barrow, exports a great deal of beef and butter, the river bringing up large fhips to the quay, with many articles for the confumption of the furrounding country. Cities. New Rofs.

Waterford is a city of confiderable importance, fituated on the river Suir,* and is fuppofed to have been founded by the Danes. A noble quay extends the whole length of the town to which large veffels can come; and a fine wooden bridge has been lately thrown over the Suire. The population is about 35,000. The chief exports are beef, pork, grain and linen. Packet-boats fail regularly betwixt Waterford and Milford Haven. Waterford.

The fea-ports of Dungarvon and Youghall are loft in the fuperior confequence of Cork; but Kinfale is a maritime arfenal, and is fuppofed to contain 8000 fouls

Of the interior towns of Ireland the principal are Kilkenny, a handfome city with above 16,000 inhabitants, and Clonmell on the Suir, a populous and flourifhing town. There are many others of refpectable fize; but Armagh, Cafhel, Tuam, &c. are rather venerable from their ecclefiaftic antiquity than important in themfelves. Kilkenny. Clonmell.

Many of the chief edifices of Ireland have been already mentioned in the defcription of Dublin. The cathedrals feldom afpire to great praife of architecture; and the villas of the nobility generally yield in fplendour to thofe of England, and even of Scotland. Among the principal villas may be mentioned Caftletown, not far from Dublin on the South, efteemed one of the moft elegant houfes in Ireland; Slane caftle on the Boyne, the feat of Lord Conyngham; Mount Juliet on the river Nore, and Woodftock in the fame vicinity; Mount Kennedy the feat of the late Lord Roffmore, Shane's caftle on Lough Neagh; Caftle Caldwall on Lough Earn, and Belleifle on the fame lake; Florence Court, the feat of Lord Ennifkillen; Weftport, Marquis of Sligo's; Woodlawn in Galway, Lord Afhtown's; Caftle Martyr, a feat of the Earl of Shannon; Roftellan near Cork; Dundrum, the feat of Lord Hawarden; Edifices.

* — That gentle Swire, that making way
By fweet Clonmel, adorns rich Waterford.
SPENSER.

Edifices.

Curraghmoer not far from Waterford; with many others too numerous to be here inserted.*

Though the turnpike roads in Ireland be rather neglected, yet the croſs roads are admirable; and Mr. Young has explained at length the principles upon which they are conducted.[15]

Inland Navigation.

The advantages derived by England from inland navigation ſoon attracted the attention of Ireland: and not many years after the example ſet by the Duke of Bridgewater, a grand canal was begun from the city of Dublin to the river Shannon, and was actually carried on to the bog of Allen, at the expence of 77,000l.[16] But the engineer's want of ability occaſioned great errors in the original plan and ſurvey; and the work was interrupted in 1770. It has ſince been completed to the Shannon near Banagher, and to the Barrow at Athy, ſo as to join Dublin by inland navigation with Limerick and Waterford. Another called the Royal canal is carrying on from Dublin to the Shannon through the counties of Weſtmeath and Longford.

A canal is completed from the ſea near Newry to Lough Neagh, and thence to the collieries of Drumglaſs and Dungannon; but the original intention of ſupplying Dublin with Iriſh coals has not ſucceeded.

The parliament of Ireland alſo granted conſiderable ſums for the canals of Lagan, Dromreagh, Blackwater, and for improving the navigation of the rivers Shannon, Barrow, and Lee.[17] Though in the firſt place, the avaricious and jobbing ſpirit of the perſons employed; and latterly, the diſtracted ſtate of the country have impeded theſe noble intentions; yet ſome of the objects have been completed, and works of this kind are now carried on with more exertion and public ſpirit.

Manufactures and Commerce.

Though we find, as has been already mentioned, that Ireland was diſtinguiſhed at an early period for her manufacture of woollen ſtuffs,†

* Mr. Young, ii. 349, obſerves that the buildings in Ireland have been almoſt wholly renewed ſince 1760, in cities, towns, and country-ſeats; and the improvements were proceeding with great rapidity till the late unfortunate commotions.

[15] Vol. ii. 151. [16] Phillips, 330. [17] Young.

† See a diſſertation by the Earl of Charlemont, T. R. A. vol. i.

yet

yet the ſpirit of induſtry made little progreſs, and the chief Iriſh manufactures are of recent inſtitution. But the linen manufacture was not unknown in Ireland in more early times, as appears from acts of parliament in the reigns of Henry VIII, and Elizabeth. In that of William III it became an object of conſequence; and in 1699 ſuch high duties were impoſed upon Iriſh woollens, that the manufacture was nearly abandoned, and the efforts of induſtry directed to the linen trade. The annual produce of the linen manufacture was computed at about 2,000,000l. ſterling, 1780[18] In the year ending January 1799 the value of Iriſh linen exported to Great Britain exceeded 2,500,000l. excluſive of that ſent to America and conſumed at home; and it has ſince conſiderably increaſed.[19]

MANUFACTURES AND COMMERCE.

But a grand portion of the commerce of Ireland ariſes from her abundant ſtores of black cattle, the moiſture of the climate rendering the paſturage remarkably luxuriant.

In 1780 Mr. Young computed the average imports of Ireland at 1,240,677.; and the exports at 2,012,202l. Yet he afterwards calculates the exports at about three millions and a half; and the balance of trade in her favour at above 1,000,000.* From the annual average taken of the three years preceding the 5th January 1799, it appeared that the total value of exports from Ireland to Great Britain alone was 5,612,689l.; whilſt the value of imports from Great Britain was only 3,555,845l. leaving a balance in favour of Ireland of 2,056,844l. This balance is however turned againſt Ireland by upwards of two millions remitted to abſentees; and by the intereſt of loans raiſed in England.[20]

[18] Young, ii. 283. 301. [19] Appendix to Lord Auckland's ſpeech on the Union.

* Tour in Ireland, ii. 333. 352. Dr. Beaufort in his Memoir, p. 145, ſays that on an average of ſeven years, to 1791, Ireland exported to the amount of 4,357,000l.

[20] Appendix to Lord Auckland's ſpeech.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE. AND SEASONS.

IRELAND lying nearly in the same parallel with England, the difference of climate cannot be supposed to be very important. The mean temperature of the North is about 48; of the middle 50; of the South 52 of Farenheit.[1] In the sixth volume of the transactions of the Royal Irish Academy may be seen a curious Memoir on the climate of Ireland, by the Rev. William Hamilton, in which the ingenious author attempts to account for a considerable change in the seasons, which has happened almost within the memory of the present generation, particularly the mildness of the winters, while the summers are less warm and genial. He supposes that the western winds are more violent, whence many kinds of trees cannot prosper, and even the ash threatens a speedy annihilation. He observes the progress which the sands have made, particularly at the entrance of the river Bannow, in the county of Wexford, where the town of Bannow, formerly so considerable as to send members to Parliament, has been overwhelmed; as has a gentleman's residence in the country of Donnegal. The tides have also assumed more power and violence. From all these circumstances, Mr. Hamilton shews the superior power of the western gales, and the consequent production of a humid and ungenial climate. He supposes that the prevalence of the Western winds is chiefly owing to the eradication of forests in Europe, Asia, and America.

Face of the Country.

In considering the face of the country it must be remembered that Ireland forms a striking contrast to Scotland, being mostly level, fertile,

[1] Transf. R. I. A. vol. ii.

and

and abundant in paſturage. The chains of hills, for they can hardly aſpire to the name of mountains, are few and unimportant. Face of the Country.

The ſoil and agriculture of Ireland are topics which have been ably illuſtrated by an intelligent writer.[1] He obſerves that the quantity of the cultivated land exceeds in proportion that of England. The moſt ſtriking feature is the rocky nature of the ſoil, ſtones generally appearing on the ſurface, yet without any injury to the fertility; whence the ſoil may be defined a ſtony clay, a ſtony loam, a gravelly ſand, &c. The ſtones are generally calcareous, and appear at no great depth, even in the moſt flat and fertile parts, as Limerick, Tipperary, and Meath. The climate being more moiſt than that of England, the verdure never appears parched with heat.* Tillage is little underſtood, even in the beſt corn counties, as Lowth, Kildare, Carlow, and Kilkenny, turnips and clover being almoſt unknown: the wheat ſown upon fallow, and followed by ſeveral crops of ſpring corn. The farmers are oppreſſed by the ſhocking ſyſtem of *middle men*, who rent farms from the landlords, and let them to the real occupiers; who, as well as the proprietors, ſuffer greatly by this ſtrange practice. Even under theſe abuſes Ireland is a moſt fertile country; and ſince encouragement has been given to agriculture, has become a treaſury of grain. Even the bogs among which that of Allen extends eighty miles, and is computed to contain 300,000 acres, might generally be drained, and converted into fertile meadows. Lime-ſtone gravel is a manure peculiar to Ireland; having on uncultivated land the ſame wonderful effect as lime, and on all ſoils it is beneficial.[3] Soil and Agriculture.

Among the chief rivers of Ireland muſt firſt be mentioned the Shannon, which riſes from the lake of Allen, and paſſing through two other large lakes, Lough Ree, and Lough Derg, afterwards extends below Limerick into a vaſt eſtuary or firth, about ſixty miles in length, and from three to ten in breadth.[4] This noble river is, almoſt through Rivers. Shannon.

[1] Young's Tour, ii. 72.

* The Curragh of Kildare is a moſt beautiful lawn, of above 4000 Engliſh acres, a ſheep walk of the ſofteſt turf, and moſt delicious verdure. Young, ii. 7.

[3] Ib, 171. Since Mr. Young wrote there has been great improvement in agriculture, and from the exertions of the Farming Societies more progreſs may be expected.

[4] Boate, p. 36.

Rivers. its whole course, so wide and deep as to afford easy navigation. Boate informs us that the celebrated Earl of Strafford designed to remove a rock, six miles above Limerick, which forming a cataract impedes the intercourse between the upper and lower parts. It has since been deemed preferable to connect the navigable parts of the river above and below the cataract by a canal. The whole course of the Shannon may be computed at 170 miles.

The other rivers of Ireland have little of this majestic character.

Barrow. The river Barrow rises about forty miles to the west of Dublin, near the source of the Boyne; and after a course of about one hundred miles enters the sea on the South-east, having received the rivers Nore and Suir, and formed the harbour of Waterford. It has been rendered navigable to Athy, where the grand canal joins it.

Blackwater. The Blackwater, another considerable stream in the South, enters the sea at Youghall Bay, being navigable from Cappoquin.

The Slaney forms the harbour of Wexford.

The Liffy is an inconsiderable stream, ennobled by the capital.

The Boyne, after a course of about fifty miles, also enters the eastern sea: the other rivers on the east are small and unimportant.

Bann. In the north the Bann is a considerable stream, which pervades Lough Neagh, and enters the sea after a course of about seventy miles. By the canal of Newry it communicates with Carlingford bay; and thus insulates the North-east projection of Ireland.

Foyle. The river Foyle passes by Londonderry, and has a considerable estuary called Lough Foyle. The Swilley is of inconsiderable length, but forms a long estuary.

On the N. W. Lough Erne issues into Donegal bay by a considerable stream; but no other river of consequence occurs till we reach the estuary of the Shannon; nor are the rivers on the S. W. of much note.

Lakes. The lakes of Ireland are numerous, and some of them extensive. The term *Lough*, corresponding with the Scotish *Loch*, is sometimes applied to an estuary, or to an inlet of the sea, such as the Swilley, the Foyle, that of Strangford in Down, &c. The chief lake of fresh water is that of Erne, which exceeds thirty British miles in length, and

twelve in its greateſt breadth; it is divided by a narrow outlet, from the ſouthern part into the northern, of about four miles in length, on an iſland in which is ſituated the town of Enniſkillen. Lakes.

Next in magnitude is Neagh, about twenty-two miles in length, and twelve in breadth. Lough Erne is ſtudded with iſlands which form a number of rich and intereſting proſpects; but Lough Neagh is one vaſt ſheet of water. The waters of the latter, or the adjoining ſoil poſſeſs a petrifying quality; but though the fact is well eſtabliſhed, the proceſs requires the inveſtigation of ſome able naturaliſt.[5] Neagh.

The lake of Corrib, in the county of Galway, is about twenty miles in length, and from two to five wide. Thoſe of Ree and Derg are leſs conſiderable in ſize: and there is a ſmaller lake, alſo named Derg, in the N W., which was remarkable in ſuperſtitious times for a little iſland containing what was called the purgatory of St. Patrick.[6] Corrib

Among the lakes of the ſecond magnitude, muſt be firſt named the beautiful and intereſting Lake of Killarney in the S. W., abounding with romantic views, and fringed with the arbutus, no where elſe a native of the Britiſh dominions. This is almoſt the only lake in the ſouth of Ireland; and the obſervation may be extended to the eaſt. On the N. W are the lakes of Eaſk, Trierty, Melvin, Macnean, and Gill. That of Allen, as already mentioned, is a chief ſource of the Shannon, into which the Gara and Key alſo pour their waters. Further to the weſt are two conſiderable lakes, the Conn and the Maſk; nor muſt thoſe of Corrafin be forgotten. Lake of Killarney.

The mountainous chains in Ireland are neither numerous nor important; but an upland ridge divides the country from the N. E. to the S. W., giving birth to ſeveral of the rivers. The Iriſh hills generally form ſhort lines, or detached groups. One group of conſiderable height appears on the weſt and ſouth of Lough Lane, or what is called the lake Mountains.

[5] Smyth in Boate, p. 121. Coote's Armagh, p. 102. Many ſpecimens of petrified wood, found adjoining to or in Lough Neagh, may be ſeen in the collection of the Dublin Society, and in private collections.

[6] Ware, p. 219, ed. 1633.

MOUNTAINS. of Killarney: of thefe Mangerton is 2500 feet above the fea.* A fmall line of hills extends on the north-weft of Bantry Bay, and paffes to the eaft under the name of the Sheby mountains.[7] To the north of this is the line of Sliebh-logher and Nagles: followed by the Galtee mountains; and towards the eaft are thofe of Knockmeledown, which bend fouthward towards the bay of Dungarvon. A fmall chain alfo appears to the fouth of Tralee, in which the lofty Brandon is confpicuous above the reft; and this, with a group to the N. E., may be faid to complete the enumeration of the mountains of Munfter.

In Leinfter is a mountain fo called, the line of Sliebh-bloom on the S. W., and a confiderable group to the fouth of Dublin, ftyled the Kippure mountains, or thofe of Wicklow. The extent of this group is about thirty Englifh miles in length, by about twelve in breadth.

In Ulfter is a fmall group, called the mountains of Mourne, in the S. E. corner of the province: one of them, Donard, is faid to be about the height of Mangerton. The hills of Sliebh-croobe (in the Irifh language *fliebh* fignifies a mountain,) form the centre of the county of Down; and feveral hills are fprinkled over the eaftern half of Antrim. On the north weft of Lough Neagh are thofe of Sliebh-gallan, and Carn-togher. Sliebh-fnaght is a confiderable mountain N. W. of Lough Foyle, whence other lines and groups extend down to Lough Erne.

The eaftern part of Connaught prefents numerous marfhes; but few mountains, except thofe of Baughta on the fouth. The extreme weftern

* Mr. Young, i. 458, fays Mangerton is 835 yards (2505 feet) above the level of the fea. A fcientific gentleman in Ireland, who has paid attention to the fubject, has communicated the following heights of the chief Irifh mountains.

Sliebh Donard, Co. Down.	2803 feet.
Mangerton, Co. Kerry.	2511 feet above the fea.
——— ——— ———	823 feet above the lake of Killarney,

meafured geometrically by the late Col. Herbert.

M' Gillicuddy's reeks, by eftimation	2800 feet, certainly higher than Mangerton.
Croagh Patrick, Co. Mayo.	2660 feet } thefe were meafured barometrically by
Nephin, Co. Mayo.	2634 feet } Mr. Kirwan.

[7] Beaufort's Memoir of a map of Ireland.

peninſula is one of the moſt mountainous regions in Ireland. Among other names may be mentioned mount Nephin in the county of Mayo, a ſolitary hill of 2646 feet, and one of the moſt conſiderable in the iſland. That of Croagh Patrick on the S. E. of Clewbay, a cone of 2666 feet; the Fernamore mountains to the weſt of Lough Maſk; and the Twelve Pins, a line of ſo many ſmall peaks in Ballinahinch; with others to the ſouth of Lough Corrib. Mountains.

Scarcely the ſemblance of a foreſt remains in Ireland; and Boate has long ſince obſerved, that the woods have been greatly diminiſhed ſince the entrance of the Engliſh, partly from the extenſion of tillage, and partly from the neceſſity of opening up the receſſes of banditti.[8] Another great cauſe was the conſumption in domeſtic fuel, and in the iron manufactures, the coal mines not having been explored. Yet Boate informs us that conſiderable woods exiſted in his time in Wicklow, Wexford, and Carlow, Kerry, Tipperary, and Cork. The province of Ulſter alſo boaſted of extenſive foreſts, in the counties of Donegal, Tyrone, Fermanagh, and Antrim. The weſtern province of Connaught, being the moſt remote from the new colony, was in his time ſtored with trees; but the moſt noted foreſts were in the counties of Mayo and Sligo. Foreſts.

The place of the foreſts was unhappily uſurped by the moors or bogs, which form a remarkable feature of the country. Boate divides them into ſeveral genera and ſpecies, forming an elaborate ſcale of ſterility. The dry heaths are chiefly confined to the mountains. The bogs he ſubdivides into four deſcriptions: 1. The graſſy, in which the water being concealed by herbage, they become extremely perilous to travellers: ſome of theſe are dry in the ſummer. 2. The pools of water and mire. 3. What he terms haſſocky bogs, or ſhallow lakes ſtudded with tufts of ruſhes, which are chiefly found in the province of Leinſter, eſpecially in King's and Queen's counties. 4. The peat moors. In the Tranſactions of the Royal Iriſh Academy,[9] there is a curious account of the formation of a bog, by the motion of a peat moor after a heavy rain: the peat moor at the ſame time, by obſtructing the courſe of a ſtream, formed a conſiderable lake, in the Moors or Bogs.

[8] Boate, p. 67. [9] Vol. ii. p. 3.

Moors or Bogs.

ſpace of half a day, But this event was rather of a local nature; and the formation of bogs ſeems to be owing, in many inſtances, to the moiſture retained in thoſe parts of foreſts which chance to form hollow receptacles, the fall of the leaves forming a vegetable earth, ſuperſaturated with moiſture, ſo that the trees themſelves in time fell a prey. Ornaments of gold and other relics of antiquity, have from time to time beeen diſcovered in the bogs at great depths; and there are other indications that they are of comparatively recent formation. It is hoped that the hand of induſtry, will in time remove many of theſe blemiſhes; and one of the greateſt improvements of modern agriculture is that of reclaiming peat moors, by means of calcareous manure. Mr. Young only divides the bogs into two ſorts, the black and the red; the former being ſolid almoſt to the ſurface, and generally improveable, though at great expence. The red is ſo called from a reddiſh ſubſtance, five or ſix feet deep, which holds water like a ſponge, yields no aſhes in burning, and is ſuppoſed to be utterly irreclaimable. Trees are found in both, and they are ſuppoſed to originate from fallen foreſts. Both differ from the Engliſh moraſſes; the Iriſh being rarely level, but riſing into hills; and there is a bog in Donegal, that is a perfect ſcenery of hill and dale. The plants are heath, with ſome bog myrtle, and a little ſedgy graſs.[10] Theſe bogs furniſh an abundant ſupply of good fuel; and though ſome have ſuppoſed them to be unwholeſome, experience does not warrant ſuch a concluſion. The bog waters, far from emitting putrid exhalations like ſtagnant pools and marſhes, are of an antiſeptic and ſtrongly aſtringent quality, as appears from their preſerving for ages, and even adding to the durability of the timber, which is found univerſally buried beneath their ſurfaces; and from the converting to a ſort of leather the ſkins of men and animals; who have had the misfortune of being loſt, and remaining in them for any length of time.*

Botany.

The ſtudy of Botany has been leſs cultivated here than in any other part of the united Empire; and the neighbourhood of Dublin, which has been beſt explored, affords no rare, and few characteriſtic plants.

[10] Tranſactions of the Royal Iriſh Academy, vol. ii. 177.

* Beaufort's Mem. 12.

From the general mildneſs of the climate, the extenſive tracts of bog, and the mountainous ranges that interſect the country, and afford capacious baſons for its numerous lakes, it is obvious that the Flora of Ireland, when complete, will probably contain ſeveral ſpecies that are ſtrangers to the reſt of the Britiſh iſlands. There will ſtill however be ſuch a reſemblance between the two Floras as to render it unneceſſary to conſider them as diſtinct. The graſſes eſteemed moſt valuable by the farmer are natives, ſo that Ireland has ever been celebrated for the excellence of its paſtures. Amongſt the rare graſſes are the Panicum ſanguinale, Bromus racemoſus, and Feſtuca calamaria. The Feſtuca vivipara and Phleum Alpinum are found on high mountains. The ſpecies of Eriophorum Carex, and other natives of bogs and pools, are very abundant. Amongſt the leguminous plants are ſome beautiful varieties of Polygala vulgaris (Milkwort), Vicia Sylvatica (wood vetch), Orobus Sylvaticus (bitter vetch), Trifolium Arvenſe, Scabrum and Maritimum. Pimpinella dioica (rock parſley), and Corrigiola littoralis (ſand ſtrapwort) are amongſt the umbelliferous tribe.* A new ſpecies of roſe, called Roſa Hibernica, has been lately diſcovered by Mr. Templeman,† and the Euphorbia Hiberna (Iriſh Spurge) is eſteemed different from the ſpecies ſo called by ſome Engliſh writers. Saxifraga umbroſa, (known in our gardens by the name of *London-pride*,) is very abundant in the neighbourhood of Killarney in the county of Kerry, and on many weſtern mountains; and Saxifraga palmata has been found on Galtymore in the county of Tipperary. The romantic ſcenery of Killarney is the moſt northern *habitat* of the Arbutus Unedo, which is now unequivocally aſcertained to be indigenous there; the heaths abound with the ſtately Erica Daboeci, and the Dryas octopetala. Arbutus uva-urſi, with other alpine plants already noticed in the botany of Scotland, expand their neglected bloſſoms, and trail their glowing feſtoons of cluſtered berries, unnoticed amidſt the wide ſolitude of their rocky faſtneſſes. Mr. Turner in his *Muſcologiæ Hibernicæ Spicilegium* has ſhown that Ireland abounds in this diviſion of Cryptogamia. Buxbaumia aphylla found near Killarney by Dr. Wade; Grimmia maritima and Dicranum Scottianum firſt deſcribed by Dr. Scott, are moſſes peculiar

Botany.

* Wade's Plantæ Rariores Hibern. † Tranſact. Dublin Society.

to

Botany. to Ireland. The Lichus tartareus, omphalodes, calicaris calcareus, and parellus, with others used in dying, are also commonly met with, and often employed by the peasants.

Zoology. In passing to the Zoology of Ireland, it may be expected that not many varieties should be found between the Irish animals and those of England. It is asserted that no poisonous animal will live in Ireland; and even that no spiders will haunt Irish timber, which, as is said, was the cause why it was often employed in magnificent ceilings in the middle ages. As in fact England affords no poisonous animal, except the viper, this position implies, in other words, that no vipers are found in Ireland.

The Irish horses, called hobbys, are of a small breed, remarkable for the gentleness of their pace.

The Irish hound is one of the noblest animals of the class, and formerly celebrated for his size and vigour, but the breed is now almost extinct.

Bede has commemorated the praise of Ireland for abundance of honey, and of milk, so that the country seems, even in early times, to have abounded in cattle. He also mentions the numerous herds of deer, which animal the progress of cultivation has now rendered rare. In various parts of Ireland are dug up enormous horns of deer, which some writers have imagined were of the species called moose deer in America; but Mr. Pennant has demonstrated that the animal must have almost doubled in size the American monster, which is sometimes found seventeen hands in height.[11] The Irish horns have been found of the extent of fourteen feet from tip to tip, furnished with brow antlers, and weighing three hundred pounds; the whole skeleton is frequently found with them. It is supposed that the animal must have been about twelve feet high.

Mineralogy. Gold. The mineralogy of Ireland has been recently ennobled by the discovery of considerable masses of native gold, in the county of Wicklow, to the south of Dublin. These were found in a brook, running west to east, to the river of Avonmore, where it is joined by the river Aghrim; and on a declivity of the mountain called Croaghan Kin-

[11] A. Z. Vol. i. p. 23.

shella,

ſhella, about ſeven Engliſh miles weſt of Arklow, and ſix ſouth-weſt of the noted copper mines of Cronbane.[12] It is ſaid that a jeweller who lately died in Dublin, often declared that gold from that ſpot had paſſed through his hands to the value of 30,000l., the ſecret being retained for many years, and ſome pieces weighing to the amount of 70 or 80 guineas. It is now worked for government, and it is ſaid that a very maſſy vein has been recently diſcovered, which it is hoped will greatly benefit the country; for mines have in all ages, ancient and modern, enriched and improved the countries where they were found, and the exception, if ſuch, of Spaniſh America is to be aſſigned to cauſes of a different nature. MINERALOGY. Gold.

Gold is alſo reported to have been anciently found in the province of Ulſter, in the ſand of a rivulet called Miola, which falls into the north-weſt corner of the lake called Neagh.[13] As minute particles of gold are ſprinkled through moſt regions of the world, ſo in ſome inſtances a few may find opportunities to combine, by the law of aggregate attraction, and thus excite notice without any chymical procedure. But to infer from ſuch a diſcovery that conſiderable quantities of this precious metal muſt be found in the mountains, whence the ſtreams have chanced to convey golden ſand, or even ſmall fragments, might only lead to raſh and ſpeculative adventure; for even in the favourite regions of native gold, it has ſometimes been found that a river or rivulet had actually carried down what little gold originally exiſted in the mountain. Another conſideration remains, well known in Peru and Hungary, namely, whether more gold may not be expended than procured, in working a mine, if virtually diſcovered.

The ſilver found in the Iriſh mines deſerves more attention. Boate mentions a mine of this metal, intermingled with lead, which was wrought in the county of Antrim, and yielded a pound of pure ſilver from thirty pounds of lead. Another, leſs productive of ſilver, was found at Ballyſadare, near the harbour of Sligo in Connaught; and a third in the county of Tipperary, thirty miles from Limerick. The ores of this laſt were of two kinds, moſt generally of a reddiſh colour, hard and gliſtering; the other, which was the richeſt in ſilver, reſembled Silver.

[12] Philoſ. Tranſ. 1797. [13] Boate, p. 67.

a blue

Mineralogy.

a blue marl. The works were deſtroyed in the Iriſh inſurrections under Charles I. The mine, however, is now wrought on account of the lead it contains.

Copper.

Copper ore is found in various parts of Ireland, and many of the mines contain evident marks of their having been wrought at a former period. That at Cronebane and Ballymurtagh, in the county of Wicklow, is of pyrites in argillite ſtrata. It contains from 7 to 10 *per cent.* of copper; and when broken is ſent to Swanſea or Neath to be ſmelted. The ſeparation of copper from its ſulphate by means of iron is practiſed here to a great extent.* The Ballymurtagh mine was opened in 1755, by Mr. Whaley, who acquired a large property from it. In Roſs iſland in the lake of Killarney, a copper mine is now working, where rich grey copper ore is procured in a matrix of quartz, having about 30 *per cent.* of the metal. At the ſame place are found native copper, ruby copper ore, malachite, and copper pyrites in great variety. The chief difficulty in procuring the ore ariſes from the water of the lake, which requires much labour to keep it out. There is alſo a copper mine on the oppoſite peninſula of Mucruſs, which is not wrought at preſent. Near Newport, in the county of Tipperary, there is a rich mine of yellow pyrites, lately opened, which promiſes to be very profitable to thoſe concerned in it.

Iron.

One of the chief mineral productions of Ireland is iron, the mines of which were little known till the time of Elizabeth. Boate divides the iron mines of Ireland into three deſcriptions: 1. What he ſtyles the bog mine, or what is now termed lowland ore, found in moors and bogs: the ore reſembling a yellow clay, but mouldering into a blackiſh ſand. 2. The rock mine, a bad ſort, the ore intimately combined with ſtone. 3. That found in various mountains, the ore ſpheric, and of a whitiſh grey colour: balls of the beſt ore contained kernels full of ſmall holes, whence the name honey-comb ore. Boate praiſes this iron as frequently rivalling that of Spain; and his work may be conſulted for the manner of conducting the founderies.

Lead, &c.

Lead is found in great abundance at Donally, near ſilver mines, in the county of Tipperary, before mentioned; at Roſs Iſland; near

* Frazer's Statiſt. Account of Wickow.

Cloghnakilty

Cloghnakilty in the county of Cork; and in the county of Wexford. That at Rofs Iſland is ſteel-grained galena, and has often veins of copper pyrites running through it. At Donalty, beſides galena, there is very rich white lead-ore. Grey cobalt-ore is found at Mucrufs in Kerry; and when the late Mr. Raſpe was in Ireland he found it uſed for repairing a road in the neighbourhood. There is alſo manganeſe and blende, both brown and black, in great abundance, in various parts of the country. NATURAL CURIOSITIES.

The beds of coal to be ſeen in various regions of Ireland have not yet been explored to their proper extent. That of Kilkenny, found at Caſtlecomer, is deſervedly celebrated among mineralogiſts, as the pureſt which has yet been traced in any quarter of the globe. Even as early as the time of Boate, coal was accidentally diſcovered in an iron mine, in the county of Carlow. Coal.

One of the moſt beautiful marbles of Ireland is found near Kilkenny; and others have been diſcovered in various parts of the iſland. Boate brands the freeſtone of Ireland as being liable to imbibe the moiſture of the atmoſphere; to prevent which effect it was neceſſary to incruſt the walls with brick, or to line them with wainſcot. Slate of various kinds is alſo abundant.

In the baſaltic region of the county of Antrim, is a white limeſtone, which reſembles chalk in many reſpects, eſpecially in containing nodules of flint; but is much harder than chalk, from having a greater quantity of water of cryſtallization *. In the county of Clare has been found fluor reſembling that of Derbyſhire. Near Belfaſt is a large ſtratum of fine gypſum; and fullers earth has been found in ſeveral counties of Ireland.

For mineral waters Ireland has never been famous. There is a ſpring, as already mentioned, at Lucan, more celebrated from faſhion than from potency. As Ireland contains abundance of iron, it is almoſt unneceſſary to add that there are many chalybeate waters in ſeveral parts of the country. The moſt remarkable are that of Ballynahinch in the dioceſe of Dromore; Ballyſpellan, not far from Kilkenny; and Caſtleconnel in Mineral Waters.

* Muſhet, in Philoſ. Mag.

NATURAL CURIOSITIES.

the county of Limerick. Swalingbar, in the county of Cavan, near Lough Erne, is much frequented on account of its sulphureous waters; and Mallow, in the county of Cork, on account of a soft and tepid spring, of the same nature as the Hot wells of Bristol *.

Natural Curiosities.

Among the natural curiosities of Ireland would, in ancient times, have been mentioned the purgatory of St. Patrick, a miserable monkish delusion. At present the lake of Killarney attracts more deserved devotion. This picturesque expanse of water is about ten miles in length, and from one to seven in breadth: it is divided into three parts, called the upper, lower, and Muckruss lake; and is surrounded by an amphitheatre of mountains, clothed with trees, whose verdure is contrasted with intervening rocks. The Arbutus, with its scarlet fruit and snowy blossoms, here vegetates in great luxuriance. Nor are cascades, and other features of rural beauty, wanting to complete the scene [14]. The isle of Innisfallen is not only romantic, but of venerable fame for the annals there written.

The petrifying power of Lough-neagh has been found, as already mentioned, rather to reside in the circumjacent soil [15]. The petrifications seem to be chiefly of oak and holly; and the stump of a tree with the roots has been found wholly petrified; but from the account given by Mr. Smith the petrification seems to be slight.

What is called the Giant's Causeway must be distinguished among the most remarkable of the curiosities of Ireland. When we recollect that a similar production, the celebrated island of Staffa, remained unnoticed till within these thirty years, we shall be the less inclined to wonder that the Giant's Causeway is an object of recent observation, and has escaped the notice of Giraldus Cambrensis, Stanyhurst, and even of the accurate and ingenious Ware: the first account is that given by Sir R. Buckley in a letter to Doctor Lister 1693. This surprizing collection of basaltic pillars is about eight miles N. E. from Coleraine [16]. The adjacent coast is verdant but precipitous; and from it the Causeway projects into the sea, to an unknown extent.

* Beaufort, Mem.

[14] Young, i. 444, &c.

[15] Boate, p. 122.

[16] Ibid. 150.

NATURAL CURIOSITIES.

The part explored is about 600 feet in length; the breadth from 240 to 120; the height from 16 to 36 feet above the level of the ſtrand. It conſiſts of many thouſand pillars, moſtly in a vertical poſition, ſome of them high; others broken, and, for a conſiderable ſpace, of an equal height, ſo as to form a pavement. They are cloſely compacted together; though the form be various, trigonal, tetragonal, pentagonal, hexagonal, and heptagonal; the moſt numerous are the pentagonal. The pillars are rarely compoſed of one entire piece, but moſtly conſiſt of ſhort or long joints, either plane, or concave correſponding with convex. The pillars are from 15 to 24 inches, or more, in diameter. The adjacent ſhore is moſtly the common crag; but there are a few irregular pillars on the eaſt; and towards the N. E. what is called the organ, in the ſide of a hill, conſiſting of fifty pillars; that in the middle 40 feet high, the others gradually diminiſhing. Similar pillars are alſo found a mile and a half inland, four miles to the weſt of the Giant's Cauſeway.

The learned Dr. Pocoke examined this remarkable object with great care, and gave an account of it in the Philoſophical Tranſactions. Mr. Hamilton has recently inveſtigated the northern coaſt of Antrim with ſcientific ſkill; and ſome particulars ſhall be extracted from his account. The grand features of this coaſt are the capes of Bengore and Fairhead, precipitous promontories diſtant about 8 miles. Bengore is compoſed of ſeveral ſmaller capes and bays; and contains a vaſt quantity of columnar baſalt. The cape called Pleſkin preſents a magnificent gallery, or colonade, about 60 feet high, with a lower gallery about 50. The lower ranges contain the moſt ſharp and exact columns. The promontory of Fairhead offers pillars of greater length, and coarſer texture: and ſimilar ſtones are found in the mountain of Dunnel, between Coleraine and the river Buſh; in the ſmall iſle of Raghry, two miles N. of Fairhead; and in various other circumjacent quarters, along a coaſt of fifty miles in length, by two in breadth. Nay imperfect appearances of the ſame kind may be traced even to the lake of Neagh, and mountains of Derry; ſo that the effects have operated to a ſpace of more than 40 miles in length, and 20 in breadth, that is above 800 ſquare miles. Mr. Hamilton might have added that even the iſland of Staffa, at the

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NATURAL CURIOSITIES.

diſtance of 100 miles, ſeems to form part of the ſame ſeries, which may be carried to an unknown extent, through the bed of the intervening ſea. The baſalt of the Giant's Cauſeway is of a very compact texture, and the angles of the pillars have preſerved their ſharpneſs, though expoſed to the ſea, for perhaps two or three thouſand years [17]. The origin of this ſubſtance is matter of intenſe diſpute between the Vulcaniſts and Neptuniſts; but ſuch geological diſcuſſions are foreign to the nature of this work. Suffice it to obſerve that baſalt contains a mixture of ſilicious and argillaceous earth, together with iron to the amount of one quarter; a proportion of that univerſal pervading mineral, which may well arrange baſalts under the claſs of iron; and it is remarkable that ſome hematites when broken preſent the ſame columnar appearance. Mr. Hamilton infers that the pillars of the Giant's Cauſeway are magnetic; and ſays, that in the ſemi-circular bays about Bengore the compaſs is much deranged. The ſame ſhore alſo preſents horizontal and bending pillars, like thoſe of Staffa; the attendant minerals are zeolite in the irregular baſalt, ſteatite, and bits of agate, red ochre, and iron ore. Mr. Hamilton, purſuing the Vulcanic theory, even adds pumice and piperino; but theſe ſubſtances are rejected by Mr. Kirwan, who infers that the detection of clay, ſteatite, or zeolite, in baſalt, is a proof that it is not a volcanic ſubſtance.

Among the natural curioſities of Ireland muſt not be forgotten the Dargle, about 12 miles to the S. of Dublin, an enchanting glen, finely wooded with oak, and near a mile in length, with high precipices, and a picturesque river, which Mr. Young deſcribes as a ſingular place, and different from any which he had ſeen in England [18]. In the neighbourhood of Mitchelſtown, at the foot of the Galtee mountains, is a cave in a limeſtone rock, the entrance of which is narrow; but from a vault, of about 100 feet long and 50 or 60 in height, there extends a winding courſe of not leſs than an Iriſh half mile, exhibiting great variety of appearances, ſometimes that of a vaulted cathedral, ſupported by maſſy columns with incruſtations of ſpar, nearly as brilliant as the Briſtol cryſtals. Mr. Young prefers this cave to that of the peak in Derbyſhire; and has alſo eſteemed it ſuperior to the Grau d'Aucel [19].

[17] Kirwan Min. i. 232. [18] Tour in Ireland i. 111. [19] Ib. ii. 61.

IRISH ISLES.

THE few, and ſmall iſles around Ireland are unimportant, but muſt not be wholly omitted. To the N. E. of Dublin is Lambey, a ſmall iſland already mentioned; and at the S. E. extremity of Ireland appear the rocks called Tuſkard and the Saltee iſles. At the ſouthern extremity is the iſle of Clare, about three miles and a half in length, and more remarkable for its ſouthern promontory called Cape Clear, than for any other object. Turning to the N. W. are the iſle of Durſey, the Hog iſlands, and the Skelligs; to the north of the latter is Valentia off the coaſt of Kerry, which is followed by the Blaſkets or Ferriter iſlands. The ſouth Arran iſlands lie at the mouth of the noble bay of Galway, and are remarkable for a ſmall kind of oats without any huſk, and for large calves: the chief is near ſeven miles in length. A number of ſmall iſlands encircle the coaſt which projects furtheſt into the Atlantic, ſuch as Garomna, Littermore, Miniſh, Iniſnee, and further to the N. W. Dunloghan, Omey, Crua, &c. Boffin was famous in the days of monaſtic ſanctity, and has retained its ancient appellation. To the north is Achill, the largeſt of the Iriſh iſles, being about 12 miles long by 10 broad. It is ſeparated from the coaſt of Mayo, by a narrow channel; but no minute deſcription of it has appeared. Iniſmurry is a ſmall iſle at the mouth of the bay of Donegal: and no other iſles worth mention appear, till we arrive at the northern iſlands of Arran, off the coaſt of Donegal. The N. W. extremity of Ireland is marked by Tory iſle: and returning towards the eaſt we meet with Iniſtrahull: and after an equal diſtance Rachlin, the Ricina of Ptolemy, and memorable as the retreat of Robert I of Scotland. IRISH ISLES.

FRANCE.

CHAPTER I.

Historical Geography.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

Names. FRANCE, deservedly celebrated amongst the most eminent European states, was probably known to the Phœnicians, though the superior fame of the metallic riches of Spain have almost eclipsed their discovery of Gaul. In the year 600 before the birth of Christ, according to the chronology of Usher, the Phocæans sailing from Ionia, founded Massilia, or Marseilles; yet Herodotus, who flourished a century and a half after that period, shows so little knowledge of Gaul as to suppose that the Danube arose in the Pyrenees. The ancient inhabitants were the Celts, of whom even Aristotle seems only to have learned that they inhabited the region above Iberia or Spain. The southern parts of Gaul became known at an early period to the Romans, who entered that region about 120 years before the christian epoch, and soon afterwards founded the province termed Gallia Bracata: but the remainder of this large and fertile country was reserved for the discovery and conquest of Julius Cæsar. The ancients sometimes styled it the country of the Celts, but the only general name seems to have been Gallia, which, after the fall of the Roman empire, was supplanted by that of Francia or France, because it was subdued and possessed by the Franks, an assemblage of tribes from lower Germany.

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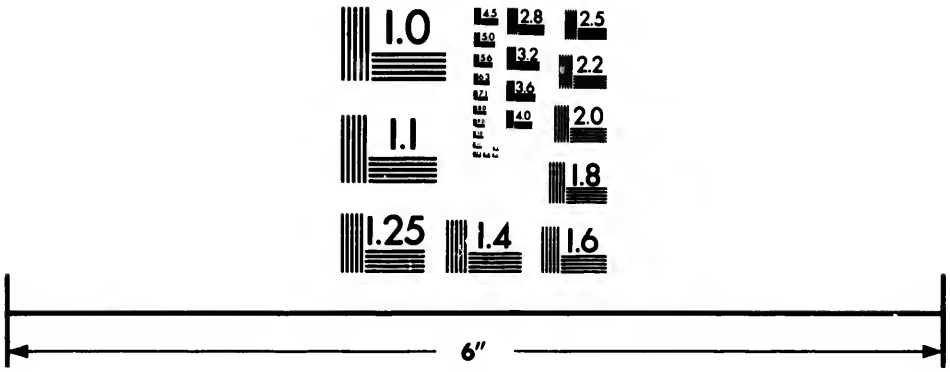

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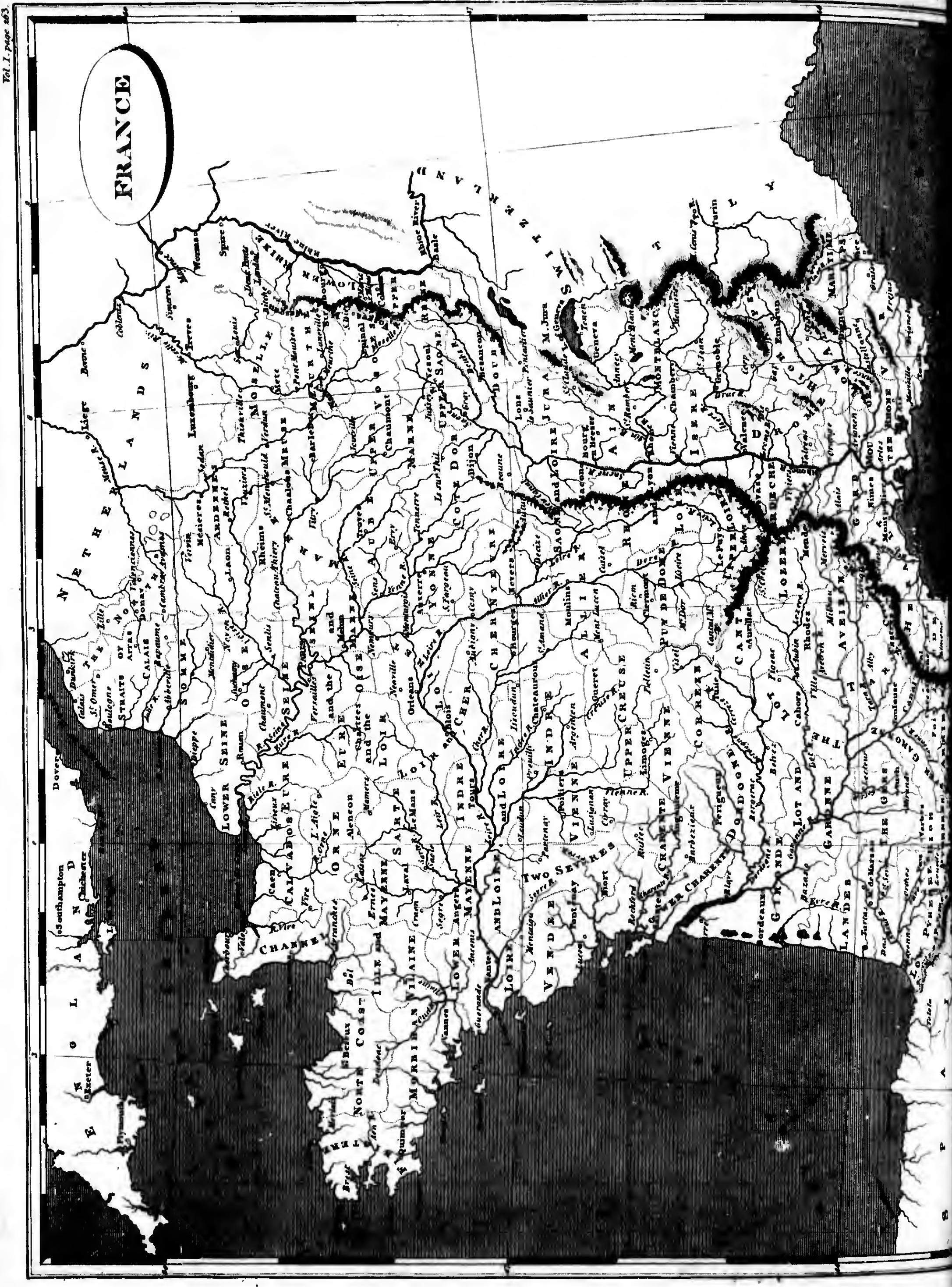

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The extent of France before the recent acquisitions was computed at 148,840 square miles; and supposing the then population to be 26,000,000, would render 174 inhabitants to each mile square[1]. The boundaries were, on the west, the Atlantic ocean; on the south, the Mediterranean and Pyrenees; on the east, Savoy, Switzerland, and Germany; on the north, the Austrian Netherlands, the German sea, and English channel. It extends from about the 42d to near the 51st degree of N. latitude; from about the 7th degree of longitude west from Paris to about the 5th on the east; being in length N. to S. about 600 British miles, and in breadth W. to E. about 560. EXTENT.

The original population of Gaul has been ably illustrated by many authors. The primitive inhabitants were the Celts, to whom no anterior people can be traced in the western regions of Europe; but on the S. W. the Aquitani, of African descent, had passed from Spain; and on the N. E. the warlike German tribes, known by the name of Belgæ, had seized on a third part of the country, where they introduced the Gothic language and manners. On the S. also the German Gauls had diffused themselves into what was called Gallia Bracata: nor must the Greek colonies be forgotten. The solidity and duration of the Roman conquests diffused the Latin language through all ranks. On the N. W. extremity it is probable that there were remains of the ancient Celts, before the British colony proceeded there in the fifth century, and imparted a name to the district. The Franks from Germany no doubt contributed considerably to the population, and were the ruling people, though not the most numerous; and their language was in the course of a few centuries immerged in that of the former population. Original Population.

The Romans first illustrated the Geography of Gaul, which they considered as divided into three chief regions, the Celtic, the Belgic, and Aquitanic; the Provincia Bracata being almost forgotten in the extent of their subsequent conquests. These regions were again subdivided into no less than seventeen provinces. On the subversion of Progressive Geography.

[1] Bœtticher, p. 18. Mr. Young, Travels i. 285, supposes France to contain 186,282 square miles, or rather, with Necker, 131,722,295 English acres; while Great Britain and Ireland may present an area of 99,335,589 acres.

the

Divisions. the Roman power new names and divisions succeeded as Flandria, Lotharingia, Neustria, Burgundia, Vasconia, &c.[2]: while Aquitania and Provincia remained ancient names, though not within ancient boundaries. These were succeeded by divisions yet more modern, which in recent times have been supplanted by more minute departments.

Ancient Provinces.	Departments.	Chief Towns.	Population.
Flandre Françoise.	Nord.	Lille.	774,450
Artois.	Pas-de-Calais.	Arras.	566,061
Picardie.	Somme.	Amiens.	465,034
Normandie.	Seine Inférieure.	Rouen.	642,773
	Calvados.	Caen.	480,317
	Manche.	Coutances.	528,912
	Orne.	Alençon.	397,931
	Eure.	Evreux.	415,577
Isle de France.	Seine.	Paris.	629,763
	Seine and Oise.	Versailles.	429,523
	Oise.	Beauvais.	369,086
	Aisne.	Laon.	430,628
	Seine and Marne.	Melun.	298,815
Champagne.	Marne.	Châlons-sur-Marne.	310,493
	Ardennes.	Mézières.	254,000
	Aube.	Troyes.	240,661
	Haute Marne.	Chaumont.	225,350
Lorraine.	Meuse.	Bar-sur-Ornain.	275,898
	Moselle.	Metz.	353,788
	Meurthe.	Nancy.	342,107
	Vosges.	Epinal.	308,052
Alsace.	Haut-Rhin.	Colmar.	382,285
	Bas-Rhin.	Strasbourg.	444,858
Bretagne.	Ille and Vilaine.	Rennes.	488,605
	Côtes du-Nord.	St. Brieux.	499,917
	Finisterre.	Quimper.	474,349
	Morbihan.	Vannes.	425,485
	Loire Inferieure.	Nantes.	368,506
Maine and Perche.	Sarthe.	Le Mans.	387,166
	Mayenne.	Laval.	328,397
Anjou.	Mayenne and Loire.	Angers.	528,912
Touraine.	Indre and Loire.	Tours.	278,758
Orlèanois.	Loiret.	Orleans	289,728
	Eure and Loire.	Chartres.	259,967
	Loire and Cher.	Blois.	211,152
Berri.	Indre.	Châteauroux.	209,911
	Cher.	Bourges.	218,297
Nivernois.	Nièvre.	Nevers.	251,158
Bourgogne.	Yonne.	Auxerre.	239,278
	Côte d'Or.	Dijon.	347,842
	Saône and Loire.	Macon.	447,565
	Ain.	Bourg.	284,435
Franche-Compté.	Haute Saône.	Vesoul.	287,464
	Doubs.	Besançon.	227,000
	Jura.	Lons-le-Saunier.	289,865

[2] D'Anville, Etats formés en Europe.

Ancient

Ancient Provinces.	Departments.	Chief Towns.	Population.
Poitou.	Vendée.	Fontenay-le-Peuple	270,271
	Deux-Sèvres.	Niort.	242,658
	Vienne.	Poitiers.	250,807
Marche.	Haute-Vienne, comprizing part of Limosin.	Limoge.	259,795
	Creuze.	Guèret.	216,255
Limosin.	Corrèze, comprising part of Upper Vienne.	Tulle.	243,654
Bourbonnois.	Allier.	Moulins.	272,616
Saintonge, comprising Aunis.	Charente-Inferieure.	Saintes.	402,105
Angoumois comprising part of Saintonge.	Charente.	Angouleme.	321,477
Auvergne.	Puy de Dôme.	Clermont.	508,444
	Cantal.	St. Flour.	246,016
Lyonnois. Forêt and Beaujolois.	Rhône.	Lyon.	345,644
	Loire.	Montbrison.	292,588
	Isère.	Grenoble.	441,208
Dauphiné.	Hautes-Alpes.	Gap.	118,322
	Drôme.	Valence.	231,188
Guyenne, comprehending Gascogne.	Dordogne.	Perigueux.	410,250
	Gironde.	Bordeaux.	519,685
	Lot and Garonne.	Agen.	352,908
	Lot.	Cahors.	383,683
	Aveyron.	Rhodez.	328,195
	Gers.	Auch.	291,845
	Landes.	Mont-de-Marsan.	288,889
	Hautes Pyrénées.	Tarbe.	206,680
Béarn.	Basses Pyrénées.	Pau.	385,708
Comté de Foix.	Arriege.	Tarascon.	191,693
Roussillon.	Pyrénées-Orientales.	Perpignan.	117,764
Languedoc.	Haute Garonne.	Toulouse.	432,263
	Aude.	Carcassonne.	226,198
	Tarn.	Castres.	272,163
	Gard.	Nimes.	309,052
	Lozere.	Mende.	155,936
	Ardéche.	Privas.	267,525
	Haute Loire.	Le Puy.	237,901
	Héraut.	Montpellier.	291,957
Provence.	Bouches-du-Rhone.	Aix.	320,072
	Basses-Alpes.	Digne.	140,122
	Var.	Toulon.	269,142
Corsica.	Golo.	Bastia.	103,466
	Liamone.	Ajaccio.	63,347

Ancient Names.	Departments Re-united.	Chief Towns.	
Territory of Avignon, county of Venaissin, Principality.	Vaucluse, with the Bouches du Rhone.	Avignon.	190,180
District of Apt.			
Savoy.	Mont Blanc.	Chambery.	283,106
County of Nice.	The Maritime Alps.	Nice.	87,071
Austrian Hainaut.	Jemmapes.	Mons.	412,129

Ancient Names.	Departments Re-united.	Principal Towns.	Population.
Weſtern Part of Auſtrian Flanders.	Lys.	Bruges.	470,707
Eaſtern part of Flanders.	Eſcaut.	Gand.	595,258
Eaſtern part of Brabant.	Deux Nethes.	Anvers.	249,376
Southern part of Brabant.	Dyle.	Bruxelles.	363,956
Part of the country of Liege, and of Gelderland.	Meuſe inferieure.	Maëſtricht.	232,662
Part of the countries of Liege, and of Limbourg, with the principalities of Stavelo, and Malmedi.	Ourthe.	Liége.	313,876
County of Namur.	Sambre and Meuſe.	Namur.	165,192
Duchy of Luxembourg.	Forêts.	Luxembourg.	225,440
Part of the Archbiſhopric of Trêves.	Rhine and Moſelle.	Coblentz.	203,290
Part of the Archbiſhopric of Trêves, and of the Duchy of Deux Ponts.	Sarre.	Trêves.	219,049
Part of the ancient Archbiſhopric of Mayence, and of the Duchy of Deux Ponts.	Mont-Tonnerre.	Mayence.	342,316
Part of the Archbiſhopric of Cologne, of the duchy of Juliers, of Pruſſian Gelderland, of Cleves, Meurs, &c.	Roer.	Aix-la-Chapelle.	516,287
Of the territory of Geneva, of the diſtricts of Gex, Larouge, Thonon, &c.	Leman.	Genève.	215,884*

Hiſtorical Epochs.

The chief hiſtorical epochs of France may be arranged in the following order:

1. The primitive population of the Celts, and the conqueſts of the Aquitani, and Belgæ.

2. The faint notices of the ancients concerning Gaul, from the eſtabliſhment of the Phocean colony at Marſeilles, to the conqueſt by Ceſar.

3. The complete diſcloſure of the country to the learned world by that great general; and the various revolutions and events of which it was the theatre under the domination of the Romans.

* The Ligurian Republic, from ancient jealouſy of the Milaneſe, ſought to become a province of the French empire, to which Neufchatel and Vallengin have been ceded by Pruſſia. They have been aſſigned as an independent principality to Marſhal Berthier.

4. The

4. The final conqueſt of the country by the Franks under Clovis, about the year 490, and the converſion of the Franks to the Chriſtian faith, five years after that period. Historical Epochs.

5. The obſcure and diſtracted hiſtory of the Merovingian race, (France being frequently ſplit into ſmall kingdoms,) till its final extinction in the middle of the eighth century.

6. The Carlovingian race, which aſcended the throne in the year 752, and was followed, twenty years afterwards, by the celebrated reign of Charlemagne, who carried the power of France to the utmoſt extent, and ſplendour which it was ever to attain; having, in particular, ſubdued the greateſt part of Germany, where he became the founder and firſt ſovereign of what has ſince been ſtyled the German empire, A.D. 800, and which remained with his deſcendants for near a century.

7. The acceſſion of the houſe of Capet in the year 987.

8. The cruſades, in which the French bore the chief ſway.

9. The wars with England. The acquiſition of France by Henry V, and its deliverance by the Maid of Orleans, or rather by Charles VII, ſtyled the victorious.

10. The reign of Louis XI, who cruſhing ſuch powerful princes as were left after the Engliſh ſhock, may be regarded as the father of the abſolute monarchy.

11. The reign of Francis I, called the father of the arts and letters, during which the French who had been regarded as barbarians by the more civilized people of Italy, began on the contrary to be diſtinguiſhed by ſuperior refinement. This is alſo the firſt epoch of a ſtanding army in Europe.

12. The inteſtine commotions with the proteſtants, and maſſacre of St. Barthelemy.

13. The reign of Henry IV.

14. That of Louis XIV, too much extolled by the French, and too much degraded by other nations.

15. The recent revolution which has aſtoniſhed Europe, and which in the ſingularity and importance of the events rivals the pages of ancient hiſtory.

ANTIQUITIES.

Several ancient monuments exist in France which are ascribed to the first epoch. The Greek colony at Marseilles seems to have imparted some degree of civilization to the country, and the rude Gallic coins are evidently in imitation of the Grecian model. Many of them occur in the metal called by the ancients *electrum*, being a native mixture of gold and silver, probably from the ancient mines in the S. of France *.

The Roman antiquities in France are numerous, and some of them in excellent preservation. Those at Nismes are particularly celebrated, consisting chiefly of an amphitheatre, and the temple called La Maison Carrè. At Paris there are also some curious remains of Roman architecture, but a mere enumeration of such remains would exceed the limits proposed †.

The other periods of French antiquity have been ably illustrated by the learned work of Montfaucon; and the disclosure of the grave of Childeric near Tournay in the last century presented some of the most curious fragments. In an old tower of St. Germain des Prés were representations of several of the first monarchs of the Franks, and many of their effigies were preserved on their tombs at St. Dennis, and other places, till the late revolution.

The monuments of the Carlovingian race are yet more numerous, and Roman mosaics have illustrated the fame of Charlemagne. France has been so little exposed to foreign conquest, or inroad, that several sacred edifices exist which were erected in this remote period. Of the

* In Picardy, and other parts possessed by the Belgæ, there are circles, and other monuments of the kind which we call druidic. Near the town of Carnac on the coast of Vannes in Bretagne, there is a grand monument of this kind, far exceeding Stonehenge, if the account be not exaggerated, which says that there are about 4000 stones, many as high as 18 or 20 feet, disposed in the form of a quincunx of eleven rows. (Monthly Magazine, Feb. 1801.) It is not a little singular that the Veneti, or people of Vannes, who opposed so great a fleet to Cæsar were Belgæ, as Strabo specially informs us, Lib. iv; an additional proof that these monuments are neither Celtic nor Druidic, but founded by the Belgic Goths, who long before the Christian era possessed the greatest part of Europe.

M. Cambri, in his *Monumens Celtiques*, has recently published superior plates of that at Carnac. It is to be regretted that his learning and judgment do not equal his zeal.

† The remains of the Roman aqueduct, called the Pont du Gard, also deserve mention as a beautiful monument of antiquity. The name is derived from the rivulet Gardin, which passes through it, and joins the Rhone below Beaucaire. *Walckenaer.* The notes thus announced are of the French translator.

later periods the monuments are so numerous that it would be vain to attempt to enumerate them. One of the most singular is the suit of tapestry, which was preserved in the Cathedral church of Bayeux in Normandy, representing the beginning and termination of the grand contest between William and Harold, which led to the conquest of England by the Normans. It is said to have been the work of Matilda, wife of William; and bears every mark of that remote antiquity. The statue of Philip Augustus, in the church of the abbey of Victory near Seules, was no mean relic of the arts of the middle ages; and St. Louis called forth many exertions of ecclesiastic skill. For later periods Montfaucon, and other learned authors, may be consulted.

ANTIQUITIES.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastic Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

RELIGION. THE religion of France was the Roman Catholic, till the recent revolution eſtabliſhed freedom of conſcience, or rather gave an undue aſcendancy to concealed atheiſm, which any ſuperſtition remarkably abſurd has a tendency to produce. But the ſtrongeſt minds as uſual remained deiſtical, inſtead of flying from one extreme to another, the accuſtomed courſe of men of volatile reflexion and confined knowledge.

Of late the catholic ſyſtem has been re-eſtabliſhed, but the popular creed has been ſo much ſhaken that little religion remains, and the churches are chiefly frequented by women. There is no doubt that the catholic ſcheme is more adapted to the French habits, than the ſerious monotony of the proteſtant religion. A ſingle calviniſtic ſunday would reduce all France to deſpair; nor is it indeed reconcileable to reaſon that a day of reſt, or feſtival, ſhould be ſuppoſed ſacred to melancholy. If this apparently ſmall conſideration could have been done away, the proteſtant ſyſtem would certainly have been found more advantageous to the national induſtry, and the marriage of the prieſts would have rendered them citizens and uſeful ſubjects of the new government. When Bonaparte aſſumed the reins of authority the catholics were ſo compleatly humiliated, that they would have accepted any terms; and it is to be regretted that the moment was not ſeized of introducing a moderate plan of chriſtianity, combining the advantages of the proteſtant faith with ſuch parts of the catholic ſyſtem as are more congenial to the habits of the people.

It muſt however be obſerved, that no toleration nor excluſive laws are known in France; but the public offices are alike open to every man, whatever be his religious perſuaſion.

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The ecclesiastic geography of France comprised 20 archbishopricks, including Avignon; and 130 episcopal sees[1]. The number of the clergy has been vaguely computed from 80,000 to 400,000, but the just number seems to have been 150,000: and in this total, many, no doubt, have been classed who were merely singers in cathedrals, or lay-officers, and servants of the church. Ecclesiastical Geography.

The Government of France has assumed more stability since the first publication of this work, every effort having been used to introduce a new dynasty in the family of Bonaparte. The author was at Paris during this important crisis, and assiduously observed its causes, and the state of the public mind. Before this event, one of the most singular in modern history, impartial Frenchmen, enlightened lovers of their country, frequently observed with regret, that the national tranquillity and prosperity absolutely depended upon the life of one man. The imprudent conduct of the house of Bourbon, unfortunately guided by the advice of ecclesiastics, unskilled in human affairs, in menacing a complete resumption of the ancient feudal system, and the punishment of all persons who had accepted offices under the new government, excited smiles of contempt mingled with deep indignation. For France had seen enough of bloodshed; and neither wished for the decapitation of eighty thousand persons, nor for the return of anarchy and civil war. Had a complete amnesty been offered, and the present order of things permitted to exist, so far as was compatible with a moderate monarchy, it is probable that a restoration might have succeeded. Government.

After having attained the consulate for life, the modesty even of vast ambition might have been satisfied, and the reward was certainly superior to the services. But power is ever encircled with a cloud of flattery, and the comparisons that began to be instituted with Charlemagne, as if there were the smallest similarity between one of the darkest of the middle ages and the illumination of the nineteenth century, began to shew how far those vile flatterers had seduced a vigorous mind. The people were however ready to make any submission rather than risk the return of anarchy: the national vanity was excited by the new dignity

[1] Young, i. 670.

of

GOVERNMENT.

of empire: the hopes of the Bourbons were annulled by a bold but cruel ſtroke of policy. The ſenate had only the choice of either naming the new emperor itſelf, or of immediately ſubmitting to the propoſed alternative of a nomination by the army, which, in that caſe, would have marched to Paris and defied all reſiſtance. The ſtatue of Modeſty was veiled, and the new dynaſty proclaimed.

Should this new order of things continue, France may be regarded as a miniature of the Roman empire, in which the hereditary claims were often violated, and a ſucceſsful General founded a new dynaſty: but the evils are incalculable, for the prevalence of military power in France will, as uſual, ſuper-induce barbariſm, with a contempt of the arts and letters, which may unhappily ſpread throughout Europe; other ſtates being obliged to maintain a conſtant military force, which will become neceſſary until France ſhall have reduced her army to a peace eſtabliſhment. At the ſame time there is a ſtriking difference between a Roman emperor and an emperor of France, ariſing from the ſupreme artifice and popular modeſty of the former; for an emperor of France is neither Sovereign Pontiff, nor Tribune of the people.

The preſent ſtate of the government of France may be moſt impartially derived from the mouth of a French author, a man of talent and obſervation *.

" The executive power of the government is lodged with complete plenitude in the will of the emperor, who has the power of adopting a ſucceſſor.

" The new laws are firſt propoſed by the government to an aſſembly of fifty members, called the Tribunate, which diſcuſſes them. They are afterwards debated by the orators of government, and of the Tribunate, before the Legiſlative Body, which ſanctions them or rejects them, without any diſcuſſion, by ſecret ſcrutiny.

" The government may retract a project of a law, in whatever ſtate of diſcuſſion it may be.

* M. Walckenaer in his tranſlation of this Geography, Paris, 1804, 6 vols. 8vo. i. 53. or in another edition of the ſame year, i. 51. Some alterations have been adopted, in conſequence of the recent change.

" The

" The Legiſlative Body, and the Tribunate, are renewed in part each year, and the new members are choſen by the Conſervative Senate, upon liſts formed by the electoral colleges of the departments, of which the members are for life. Theſe electoral colleges of the departments are choſen by the electoral colleges of the *arondiſſemens*, or diſtricts themſelves, elected by aſſemblies of each Canton, or what might be called in old Engliſh tything, compoſed of houſeholders. The emperor names the Preſident of each aſſembly of the Canton; and the preſident chuſes the ſcrutators and the ſecretary. Theſe aſſemblies, as well as thoſe of the electoral colleges, are convoked and diſſolved by order of the emperor; who can alſo add to each college of the diſtrict ten members named by himſelf, and twenty to each electoral college of the department.

" The members of the Conſervative Senate are for life. The nomination belongs to the emperor, who preſents three, of whom the choice belongs to the Senate itſelf; or, according to another diſpoſition, the emperor may preſent one, the Tribunate one, and the Legiſlative Body one. Theſe members muſt be taken from a liſt, formed by the electoral colleges of the departments; but the emperor may, without the participation of the Senate, and without any attention to the electoral colleges, name any perſon member of the Conſervative Senate, provided that he have attained the age preſcribed by the law, and that the number do not exceed one hundred and twenty. It muſt be obſerved, that the Senators may be Miniſters, Ambaſſadors extraordinary, and occupy other employments of great conſequence, which are at the diſpoſal of the government.

" The Senate cannot proceed to any buſineſs, except it be propoſed by the emperor, ſave only in caſes of its own arrangements. But by its *ſenatus-conſultes*, which cannot proceed except upon the propoſition of the emperor, it exerciſes ſupreme power even upon the conſtitutional laws, in adding, explaining, or ſuſpending the execution; in diſſolving the Legiſlative Body, and the Tribunate; and even in annulling the judgments of the civil and criminal tribunals, when it ſuppoſes them obnoxious to the ſafety of the ſtate.

 " Excepting

GOVERNMENT.

"Excepting the ſupremacy of the Senate, and right of pardon, which belongs to the emperor, the Tribunal of Caſſation exerciſes the ſupreme judiciary power, with a right of cenſure and diſcipline over the Tribunals of Appeal, and the Criminal Tribunals, annulling their judgments in caſes of contradiction to the law, or want of form, and even with the power of ſuſpending the judges. There is a Grand Judge or miniſter of juſtice, who, on ſolemn occaſions, preſides in the Tribunal of Caſſation, and the Tribunals of Appeals. There are alſo, unhappily, for certain crimes Special Tribunals; of which the judgments are not ſubject to appeal, being exempt from the ordinary forms. All the Judges, except the Juſtices of Peace, are for life, and named by the emperor, nevertheleſs for thoſe of the Tribunal of Caſſation he preſents three perſons to the Senate, whoſe choice is definitive.

"A longer detail concerning the French conſtitution, ſtill ſo new, and of which the moſt intereſting portion for the future happineſs of France ſtill reſts perhaps in the thought of the Legiſlature, would be uſeleſs. Thoſe who reflect know how difficult it is to ſpeak with any degree of propriety of a government which has accompliſhed ſuch great objects, and ſucceeded to ſuch oppoſite factions, and towards which are neceſſarily directed all the enmities of fruſtrated ambition, and all the hopes of thoſe who ſtill aſpire." *

The Senate is regarded as the chief authority in the ſtate, after the Emperor; and perhaps as repreſenting the entire nation. But the Council of State, which meets in the Imperial palace of the Tuileries, and conſiſts of about thirty members, is of more real ſolid authority; and the members, in general, men ſelected for talents and experience,

* M. Donnant obſerves, that the preſent conſtitution of France preſents four departments. 1. The Emperor, ſurrounded by a Council of State, which directs the forms of laws, and reſolves any difficulties which may occur in the adminiſtration. There are ſeven miniſters, namely, the grand judge miniſter of juſtice, the miniſters of the exterior and interior, of the finances and of the treaſury, of war and the marine, to which may be added, the miniſter of the police. 2. The Conſervative Senate, conſiſting of eighty members, and ſo called becauſe it ought to preſerve the conſtitution, being the higheſt deliberative aſſembly. 3. The Legiſlative Body, of three hundred members, admits or rejects new laws by ſecret ſcrutiny. 4. The Tribunate, of one hundred members, deliberates on the projects of laws. The chief tribunal of Caſſation is the laſt court of reſort: there are beſides tribunals of the firſt inſtance, of appeal, criminal, ſpecial, &c.

form

form perhaps the moſt reſpectable ſociety of Paris. Of theſe councillors of ſtate four, with the miniſter of the police, ſuperintend the general police of the empire; which vibrates like a ſpider's web from the extremities to the centre, and maintains a vigilance unknown even to the Bourbons. GOVERNMENT.

In the whole of this conſtitution an Engliſhman is impreſſed with the moſt radical defect, the total want of all oppoſition. In France an opponent is an enemy, and muſt be guillotined: the paſſions being ſo vehement, that contradiction leads to aſſaſſination. It has been obſerved, that if the oppoſition were to be annihilated in England, the monarch would hire one, it being his intereſt that his miniſters ſhould not fall into groſs miſtakes. But in France abſolute power has been the author of its own ruin, and ever will be, till the French character can tolerate an oppoſition.

The civil laws of France have been recently digeſted into one ſmall volume. It is divided into three books, the firſt concerning perſons, the ſecond, property, and its different modifications, and the third the manner in which it may be acquired. This code is remarkable for elegance and perſpicuity *.

The population of France was formerly computed, as already ſtated, at 26,000,000, but the recent acquiſitions, if durable, would ſwell it to the formidable extent of 32,000,000. At all events France is a country teeming with population, and quickly reſumes her vigour after ſtupendous loſſes, as Europe has repeatedly experienced. Population.

The French colonies are at preſent unimportant, notwithſtanding the addition of the Spaniſh part of St. Domingo. The beſt of them have been convulſed and ruined for a ſeaſon by inteſtine commotions, ariſing from the wild theory of the rights of man being extended to the negroes, who feel that they have a right to ruin and deſtroy, but none to build and improve. Perhaps the right of horſes may next be diſcuſſed; and our race-horſes be faſtened to the plough, while our coach-horſes ſtart for the prize at Newmarket. The intercourſe with the remaining colonies is ſo much obſtructed by the Engliſh dominion of the ſea, Colonies.

* Paris, 1804, 4to. 8vo. 12mo.

Colonies. that they can hardly be admitted into an eſtimate of the preſent ſituation of France.

Army. The political convulſions which have agitated this unhappy country, the enthuſiaſm, and yet more the deſpotiſm, of freedom, have occaſionally within theſe few years ſwelled the French armies to the amazing computation of upwards of a million. But it may ſafely be doubted whether the real amount at any time exceeded 600,000 effective men, the French having ſwelled the number to intimidate their enemies, and the latter to apologize for their defeats. Under the royal government the army of France was eſtimated at 225,000, of which were ininfantry 170,000, cavalry 44,000, artillery 11,000 *.

Navy. The maritime power of France was formidable even to England, till the battle of La Hogue, ſince which the Britiſh flag has reigned triumphant on the ocean, and the ſtruggles of France, though often energetic, have encountered the fixed deſtiny of inevitable defeat. So frequent, fatal, and deciſive, have been the recent humiliations of the French navy, that hardly the ſemblance of a warlike fleet could be preſented, except by the conſtrained aſſiſtance of Spain. About twenty ſhips of the line conſtitute the maritime power of France, being not above one quarter of its former extent. Nor can the loſs be eaſily redeemed, for though ſhips may be bought or conſtructed, it muſt be the labour of many years to form a numerous body of experienced ſeamen.

Revenues. The revenue of France was formerly computed at about 30,000,000l. ſterling; from which, after deducting the expence of collection, and the payment of the intereſt on the national debt, there remained clear about 18,000,000. The national debt may be regarded as greatly reduced;

* By the Etat Militaire, a calendar revived, for the eighth year of the republic, it appears that the French armies conſiſted of 110 demi-brigades, each of three batallions, and when complete of 3,200 men: of 30 light demi-brigades of a like number: 8 regiments of foot artillery, each of 20 companies; 8 of horſe-artillery, each of 466 men: 26 regiments of cavalry, and 20 regiments of dragoons, each of 800 men: 25 regiments of chaſſeurs, and 12 regiments of huſſars of the like number. The whole, without including the engineers, miners, &c. &c. forming a force of 413,728.

It is ſuppoſed that the conſcription, the preſent oppreſſive mode of raiſing ſoldiers in France, might, if carried into full effect, preſent a maſs of about a million of ſoldiers. *Walckenaer.*

but

but any attempt to calculate the present state of the revenue must be vague and inconclusive. According to the most recent accounts it amounted to about 600,000,000 livres, or about 25,000,000l. sterling *. Revenues.

The common current money of France has been computed at 90,000,000l. sterling, while that of Great Britain has been estimated at 40,000,000. The late conquests have enriched France, and especially Paris, with the rapine of many provinces; and the generals vie with the Romans in wealth and luxury.

The political importance and relations of France continue to be vast; nor was the prodigious power of this state ever so completely felt and acknowledged, as after a revolution and a war which threatened her very existence. When expected to fall an easy prey, she suddenly arose the aggressor, and has astonished Europe by the rapidity and extent of her victories. The rivalry of many centuries between France and England sunk into a petty dispute, when compared with this mighty contest, which will be felt and deplored by distant posterity. Political Importance and Relations.

* M. Walckenaer says, that the revenue 1804, was seven hundred millions of francs; and the interest of the public debt is about eighty-four millions. See his long and curious note upon this subject, vol. i. p. 60, of the French translation. M. Donnant, who is well versed in statistics, communicated to me the manuscript of an important work upon this subject, in which he estimates the revenue at more than eight hundred millions during war, and about seven hundred in peace. The taxes are doubtless heavy, but there being no privileged classes, the lands are more fully cultivated, and the wealth more equally divided. The constituent assembly had adopted the system of the œconomists, that of direct impost; but it was found alike grievous and inefficient. At present the contributions are *Fonciere*, *Mobiliaire*, and *Personelle*, with stamps, customs, patents, or permissions to shopkeepers, (a kind of shop-tax,) loteries, *octrois*, and *doits de passe*, and taxes on carriages and snuff. The national domains also form a resource; but the *Comptabilité Nouvelle* is arranged. The national debt seems about fifty millions sterling.

The *Comptes Généraux du Tresor Public*, Paris, at the Imperial press, 1805, 4to. are now before me. They were presented to the emperor by *Burbé Marbois*, a minister of known exactness and probity; but the various years are so confounded, that it becomes a matter of calculation to discover the receipt and expence of 1804. From the prefatory address to the emperor, p. 13, it appears, that seven millions have been assigned for repairing the highways, two millions for the noble road by Mont Simplon, a like sum for the great bridges; six millions for canals and drying marshes, two millions and a half for internal navigation, and three for the restoration of the sea-ports. In page 128, 129, the annuities are stated at 19,288,550 francs, and the pensions at 24,891,177. It appears from p. 111, that the total receipt of the twelfth year was 764 millions, and the expence 758 millions, or about thirty-two millions sterling.

Yet

POLITICAL IMPORTANCE, &c.

Yet by the protection of all-ruling Providence the British empire rose superior to the struggles, and remained free from those scenes of carnage and devastation, which attended the French progress into other countries: and the French navy being reduced to so insignificant a force, Great Britain has less to apprehend from France, than at any former period. Yet this invaluable advantage is somewhat diminished by the decided preponderance of French power on the continent; particularly in Holland, which formed the grand chain of our commercial intercourse. After all the continental powers have failed, it would be vain to suppose that any one of them, single and detached, can be really formidable to France. And though some thousands of miserable peasants may be at any time induced by foreign gold to form an insurrection in any country, and desperadoes as easily found to conduct them, yet there is little cause to suppose that France would be divided against itself; for the love and admiration of his country may be pronounced essential passions of a Frenchman, who despises a foreigner while he is under the necessity of requesting his assistance. The distance of Russia, the second, if not the first power on the continent, renders her favour or enmity of small importance to France; but between this last country and the Austrian power lasting jealousy and enmity have subsisted, since the reign of the Emperor Charles V; and a collision of interests in Germany, Swisserland, and Italy have contributed to maintain this rivalry. The envied acquisition of Silesia, and other causes, having likewise excited a rooted hatred between Austria and Prussia, it is natural that the latter country should either conspire with France against the Austrian greatness, or connive at its fall. Yet to a calm and unprejudiced spectator it might appear the most sound policy for these three great powers to abandon inimical views, and to regard with a general eye of defence and jealousy the growing and already exorbitant power of Russia; which may in time consider them as provinces, and overflow Europe with another torrent of barbarism *.

* If the President of the French Senate, François De Neufchateau, had perused with candour this view of the political relations of his country, he ought to have refrained from publishing his long and

and violent attack upon all the political parts of this work, under the title of *Tableau des Vues que se propose La Politique Anglaise, dans toutes les Parties du Monde.* The author of this geography was then detained at Paris, and could not venture to reply, as a publication from a man of such weight as the President of the Senate, and such talents as François De Neufchateau, menaced him with no less than the Temple. At present, he may aver, that this long attack consists merely of misrepresented fragments; that no man can be more averse to kindle wars between nations, though he sometimes must argue upon the supposition that such wars may happen: that, in fine, the author wrote as a geographer and cosmopolite; and though he admire the maxim of Fenelon, "Inasmuch as I "love my country better than myself, so I love the human race better than my country;" yet is he to be blamed for having written with the feelings of an Englishman?

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Cuſtoms. — Language. — Literature. — Education. — Univerſities.— Cities and Towns.—Edifices.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE manners and cuſtoms of the French have been ſo often delineated, that the theme has become trivial and familiar. The moſt pleaſing parts of the portrait are vivacity, gaiety, politeneſs, a ſingular diſpoſition towards ſocial enjoyments, and that ſavoir vivre which enables the adept to diſpoſe of his occupations and pleaſures in an agreeable ſucceſſion, free from liſtleſſneſs or fatigue. In general Frenchmen regard care as a mortal poiſon, and ſtudy, if poſſible, to avoid its moſt diſtant approach. On the other hand ancient and recent events conſpire to affix a ſanguinary ſtain on the national character, which one would little expect amid ſo much gaiety, and ſeeming benevolence. The cauſes of this incongruity might afford an ample ſubject for philoſophical enquiry. Even the violent changes which have taken place ſeem to have little affected their characteriſtic gaiety, and Paris continues to be one of the happieſt cities in the world: while the ſcreams of maſſacre reſounded in ſome parts of the city, in others the theatres were crowded, and nothing was heard but ſounds of pleaſure.

The ancient and rooted enmity between France and England nouriſhed many prejudices againſt the French character, which have ſince diſappeared in the reports of more candid authors. Yet, with travellers accuſtomed to the elegance of Engliſh life, many of the French manners and cuſtoms cannot be reconciled to ideas of phyſical purity; and the example of the perſonal and domeſtic cleanlineſs of the Engliſh muſt ſtill be recommended to imitation. The laws and decency of marriage are alſo frequently ſacrificed; and the looſeneſs of the French morals, in regard to the ſex, has become proverbial. A republican

publican form of government has not ſuper-induced republican manners, nor has the liberty of divorce proved any bond of chaſtity. As every thing continues to be ruled by faſhion, it is not unreaſonable to hope that even virtue may become faſhionable. MANNERS AND CUSTOMS.

While ſome phyſicians have attempted to account for Engliſh melancholy from the quantities conſumed of animal food, it appears on the contrary that a Frenchman will devour as much as two Engliſhmen, diſguiſed, indeed, and modified, ſo as to beguile and ſtimulate the appetite to larger indulgence. In the difference of climate therefore, and in the uſe of light wines, muſt be ſought the chief phyſical cauſes of this diſcrepancy. The houſes of the French often diſplay a ſtrange mixture of magnificence and naſtineſs; and while even a cottage in England will ſhew attention to the comforts, conveniences, feelings, and infirmities of human nature, in France the noſe may be aſſailed, while the eyes are enraptured. France has long afforded models of dreſs to all Europe, nor have the faſhions of Paris yet totally loſt their fantaſtic authority. In the frequent and ridiculous alluſions to the ancient republics, none of which bore the moſt diſtant reſemblance of modern France, it was natural that the Grecian and Roman dreſs ſhould afford models of imitation, and an infallible conſequence that the dreſs would become more elegant. In a country where life itſelf is an amuſement it is to be expected that the diverſions ſhould be infinitely varied. In the capital theatrical repreſentations bear the chief ſway, and every evening about twenty theatres are open and full. Yet theſe republicans do not rival their favourite Greeks and Romans, in opening theatres and amphitheatres at the expence of the government, an inſtitution worthy of modern imitation, as to afford amuſements to the people may frequently ſave them from finding their own amuſements in drunkenneſs and other low vices *.

The French language is the moſt univerſally diffuſed of any in Europe. In variety, clearneſs, and preciſion, and idioms adapted to life, buſineſs, and pleaſure, it yields to no modern ſpeech; but it wants force and Language.

* M. Walckenaer obſerves, that there is a diſtinguiſhed difference between the inhabitants of France on the north of the Loire, and thoſe on the ſouth, in features, temperament, manners, and character. The laſt are not the beſt.

Language. dignity, and yet more, ſublimity, ſo far as a ſtranger may venture to judge. The critics and academicians of the ſeventeenth century enacted ſuch ſevere laws of purity, that, like gold reduced to the utmoſt fineneſs, it has become ſoft and incapable of deep impreſſions. The French language is a well known corruption of the Roman, mingled with Celtic and Gothic words and idioms. Even in the tenth century it continued to be called Romance; a name which afterwards paſſed to the poems and tales of chivalry, as being compoſed in this dialect. One of the earlieſt ſpecimens of French proſe is the hiſtory by Villehardouin, which was followed by Joinville's life of St. Louis, and the copious and ſingular chronicle of Froiſſart. But while the Italian remains the ſame from the days of Dante and Petrarca, the epoch of claſſical purity of the French language commences with the reign of Louis XIV. The recent revolution has introduced ſuch exuberance of new words, and phraſes, that a neological dictionary would be required to explain them.

Literature. The literature of France has in modern times excited great reſpect and admiration. In the bold exertions of inventive genius, and even in profound productions of philoſophy, France cannot aſpire to vie with Italy or England; but in the pleaſing and beautiful paths of invention, and in books of elegant learning and exact ſcience, ſhe remains almoſt unrivalled. French literature, like that of the other modern countries of Europe, originates with the eccleſiaſtics, who compiled chronicles and theological productions. Even in the Roman period ſome authors of reſpectability appeared in France, as Auſonius, a native of Bourdeaux; Sidonius Apollinaris, and others; and Severus Sulpitius, author of the life of St. Martin, has been ſtyled the chriſtian Saluſt. Nor did the conqueſt of Gaul by the Franks break the golden chain of ſcience, which was continued by Gregory of Tours, and other venerable writers. The collection of ancient hiſtorians of France is ſingularly complete, and important. In the eleventh century the uſe of the Latin began to be ſupplanted by the modern dialect. But it would be idle and ſuperfluous to attempt to enumerate the crowd of modern authors, who have reflected honour on their language and country. Who is a ſtranger to the Roman grandeur of Corneille, to the tender and

and elegiac elegance of Racine, the tragic pomp and terror of Crebillon, the comic powers of Moliere, the naiveté, the subtle simplicity of La Fontaine, the placid instruction of Fenelon, the gaiety of Gresset, the caustic vivacity of Voltaire? LITERATURE.

The state of education in all the Catholic countries was very defective, till the Jesuits acquired great estimation by their attention to this important department; to which if their exertions had been solely directed they would have proved a most useful body of men. The want of proper schools for the poor will, it is hoped, be remedied in the new course of things; and to this cause may perhaps be chiefly imputed the want of real and solid information, and of talent for political business, which have surprised the spectators of the French revolution. When the civil commotions in England destroyed all power, except that of knowledge, the number of men of talents, who arose in every department, infinitely exceeds that which the recent events of France have displayed. Nor, as ignorance naturally leads to crime, and the want of education at once darkens and hardens the mind, can this defect be excepted from the causes of the sanguinary events which have appalled Europe. National education has justly attracted the attention or the new rulers, with what success time must discover; for there is a wide difference between forming a plausible scheme, and the putting of it in lasting execution, with regulations and funds that support themselves. Under whatever form of government the ignorant will be found the most unmanageable; and those jacobines who attempted to extinguish what they termed the aristocracy of knowledge, united, as usual, every vice to consummate ignorance. Education.

France formerly boasted of twenty-one universities; in the north Douay, Caën, Paris, Rheims, Nanci, Strasbourg; in the middle provinces Nantes, Angers, Poitiers, Orleans, Bourges, Dijon, Besançon; and in the south Bourdeaux, Pau, Perpignan, Toulouse, Montpellier, Aix, Orange, Valence.[1] Of these the Sorbonne of Paris was the most celebrated; but it shewed an irremediable tendency to prolong the reign of scholastic theology. The academies and literary societies were Universities.

[1] La Croix Geographie, Tome i. 279.

UNIVERSITIES.

computed at thirty-nine. Those of Paris in particular have been long known to the learned world, by elegant and profound volumes of dissertations on the Sciences, and on the Belles Lettres. Nor have public institutions of this kind been foreign to the consideration of the new government *.

Cities and Towns. Paris.

The ample extent of this country displays a corresponding number of important cities and towns. Paris, the capital, rises on both sides the river Seine, in a pleasant and healthy situation, with delightful environs. It is divided into three parts; the town, *ville*, on the north, the city in the middle, that part called the university on the south. It is mentioned by Cæsar [2] as being restricted in his time to an island in the midst of the Seine. An intelligent traveller supposes Paris to be one third smaller than London: [3] and if so the inhabitants can scarcely exceed 400,000; yet some compute them at more than 600,000. † The houses are chiefly built with free stone, from quarries like catacombs which run in various directions under the streets; so that an earthquake would be peculiarly destructive, and might bury part of the city. The banks of the Seine present noble quays; and the public buildings are not only elegant in themselves, but are placed in open and commanding situations. The Louvre is arranged among the best specimens of modern architecture; and the church of St. Genevieve, now the Pantheon, is also deservedly admired; nor must the Tuileries, the Palais Royal, and the Hospital of Invalids be forgotten. Paris no doubt exceeds London in magnificence, but yields greatly in cleanliness and convenience; and the streets, generally without accommodation for foot passengers, loudly bespeak the inattention of the government

* The present mode of education is by two sets of schools, the first called primary, for the earlier rudiments of instruction; the other called secondary, for Latin, &c. The denominations are not unobjectionable, a primary school rather denoting one of the first or highest order. These are followed by *Lycées*, or Lyceums, which supply the place of the ancient colleges. There are also special schools; as the college of France which still exists, schools of medicine at Paris, Montpelier, and Strasburg, schools of mines, &c. The public instruction is superintended by a minister named for that purpose; at present the office is deservedly filled by Fourcroy, who, when the author left France, was employed in visiting all the *Lycées* of the empire.

[2] Comm. lib. vii. 54. [3] Young's France, i. 76.

† By an enumeration in 1803, the number was 547,756. Walckenaer.

to the middle and lower claſſes of men. The environs of the Bois de Boulogne, Mont Martre, Paſſy, St. Dennis, &c. are pleaſingly diverſified. The recent revolution has little impaired the beauty of Paris; on the contrary the rapine of ſeveral provinces has enlarged and adorned the public collections; and by enriching numerous individuals, has enabled them to increaſe their favourite city with new and beautiful ſtreets and ſquares. Cities and Towns.

Next to Paris in extent and population was the noble city of Lyons, which was ſuppoſed to contain about 100,000 ſouls. As the chief manufactures were articles of luxury, ſilk, cloths of gold, and ſilver, &c. it was natural that this venerable town ſhould be firmly attached to the ancient ariſtocracy, though with conſequences incalculably fatal to its proſperity. During the infatuated reign of the jacobins it was beſieged, captured, and after the wildeſt and baſeſt maſſacres, was doomed to final demolition. But as there are bounds even to rage and folly, this decree was only executed in part; though Lyons will probably never recover its ancient extent and opulence, for commerce when once expelled ſeldom returns. Lyons.

The third and fourth cities of France are Marſeilles, and Bourdeaux; each peopled by about 80,000 ſouls. The foundation of Marſeilles has been already mentioned, and the city remains worthy of its ancient fame, the port being at the ſame time one of the beſt and moſt frequented in the whole Mediterranean. The exchange is a noble building, and the new parts of the city are beautiful. Marſeilles.

Bourdeaux was a proſperous city, but the trade muſt have ſuffered great injury. The port is ample and commodious, with extenſive quays. The chief exports are wine and brandy, particularly the vin de Bourdeaux, which we term claret, becauſe it is of a clear and tranſparent red, while tent and ſome other wines are opake. The theatre is the moſt magnificent in France, and the actors uſed to receive extravagant ſalaries; and as much as London exceeds Paris, ſo much did Bourdeaux, before the revolution, tranſcend Liverpool[4]. Bourdeaux.

In giving a brief idea of the other chief cities and towns of France, it may be premiſed that thoſe of the Netherlands formerly belonging to

[4] Young, i. 60.

Auſtria,

Cities and Towns.

Auſtria, are reſerved for ſeparate deſcription. But among thoſe which formerly belonged to what was ſtyled French Flanders, may be named

Liſle.

Liſle and Valenciennes; the former more memorable for its ſtrength than for its manufactures of camlets and ſtuffs. The population is

Valenciennes.

computed at 60,000. Valenciennes is alſo remarkable for the ſtrength of its fortifications; yet on the 26th July, 1793, it ſurrendered to the Engliſh and Auſtrian army, under the Duke of York; but was retaken by the French army in the following year. The chief manufactures, lace, camlets, and cambrics.

Amiens.

Amiens is a conſiderable town, with a population of about 40,000; but Rouen, formerly the capital of Normandy, contains 72,000 ſouls, and carries on a conſiderable trade. Breſt is more remarkable as being the chief maritime arſenal of France in the North, than for its extent or population, which does not exceed 30,000. Nantes, with a population of 56,000, is a beautiful commercial city, with a ſplendid theatre, and many new ſtreets, but the environs are barren and unintereſting[1]. Orleans, a city of about 40,000 ſouls, is celebrated by two ſieges which it ſuſtained, one againſt Attila, king of the Huns, in the fifth century, the other againſt the Engliſh in the fifteenth. The duchy of Orleans has long been the appanage of a branch of the royal line, the revenue having been computed at the enormous ſum of about 300,000l. ſterling. Nancy in Lorrain is not equal to Metz in extent, but is one of the moſt beautiful cities in France. Straſbourg is a venerable city, with a population of about 40,000, ſeized by Louis XIV in 1681, and confirmed to him by the peace of Reſwick in 1697. The fortifications are ſtrong; and the gothic cathedral preſents the well-known ſpire of 574 feet in height.

Toulouſe.

Few of the other inland towns deſerve mention, except Toulouſe, a city of 50,000 ſouls; and the parliament of which was eſteemed, under the old government, next in rank to that of Paris: the extent is great, but the manufactures are trifling, though here be the termination of the great canal, opened by Louis XIV, from the Mediterranean to the Garonne, a work truly magnificent, and which alone would preſerve

[1] Young's France, i. 104.

his

his memory to future ages. Montpellier, on the Mediterranean, with delicious and highly ornamented environs, and a noble aqueduct, is of considerable extent, but particularly celebrated by the salubrity of the air, and an ancient school of medicine. The prospect is singularly extensive, and interesting, embracing the Pyrenees on the one side, and on the other, the yet grander summits of the Alps [6]. Cities and Towns.

Several of the most noble edifices of France are in Paris, and its vicinity. To those already mentioned must be added the palace of Versailles, rather remarkable however for the profusion of expence, than for the skill of the architect; the parts being small and unharmonious, and the general effect rather idle pomp than true grandeur *. The bridge of Neuilly is esteemed the most beautiful in Europe, consisting of five wide arches of equal size, instead of our small side arches which degrade the dignity of such fabrics. That of St. Maxence is by the same celebrated artist. The ancient cathedrals and castles are so numerous that it would be idle to attempt to enumerate them; and the French nobility were not contented, like those of Spain, with large houses in the cities, but had grand chateaux scattered over the kingdom, to which, however, they seldom retired, except when compelled by formal banishment from the court. Edifices.

The inland navigation of France has been promoted by several capital exertions. The canal of Briare, otherwise styled that of Burgundy, was begun by Henry IV, and completed by Louis XIII, opening a communication between the Loire and the Seine, or in other words between Paris and the western provinces. Passing by Montargis it joins the canal of Orleans, and falls into the Seine near Fontainbleau. This navigation of forty-two locks, is of great utility in inland commerce [7]. Inland Navigation.

[6] Young's France, i. 48. For a more ample account of the French cities, the reader may consult a long note of M. Walckenaer, in the French translation of this work, vol. i. p. 88.

* The author has since viewed this celebrated edifice with an eye of complete impartiality. Towards the garden it is truly noble; but the other front is degraded by the old little chateau of Louis XIII, built in a bad style, and disfigured with minute ornaments; which was preserved in the centre of the building, as a capricious object of comparison, in contradiction to the advice of the architect.

[7] Philips, 51.

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INLAND NAVIGATION.

The canal of Picardy extends from the Somme to the Oise, beginning at St. Quintin, and forming a convenient intercourse to the provinces in the N. E.

Canal at Languedoc.

But the chief work of this description is the celebrated canal of Languedoc, commenced and completed in the reign of Louis XIV, by Riquet the engineer, under the auspices of that able minister Colbert. Fifteen years of labour were employed, from 1666 to 1681, and the mechanical ignorance of the period was surprised at a tunnel near Beziers, of only 720 feet, lined with free stone. This noble canal begins in the bay of Languedoc; and at St. Ferriol is a reservoir of 595 acres of water: it enters the Garonne about a quarter of a mile below the city of Toulouse. The breadth, including the towing paths, is 144 feet; the depth 6 feet; the length 64 French leagues, or about 180 miles. The expence was more than half a million sterling.

The other canals in France are very numerous; the new canal of the Ourq rather resembles our New River, being chiefly intended to bring good water to the eastern extremity of Paris; but, though of supreme utility, they are too minute to enter into this general view of the kingdom.

Under this head may also be mentioned the noble embankment of the river Loire, called the Levè, extending from Orleans to near Angers. It is about forty feet wide at the base, its elevation about twenty-five, the paved road on the top, admitting three carriages abreast. This noble bulwark was erected to protect a flat country from the inundations of the river; but the date seems uncertain. It may probably be traced in the provincial histories.

Manufactures and Commerce.

For a century, extending from 1650 to 1750, Mr. Young[1] supposes France to have possessed the most flourishing manufactures in Europe; and French writers affect to speak of the English manufactures as being of recent fame. A sketch of this important subject, particularly interesting to Great Britain, as the rival of France, shall here be traced from that well-informed author. At Abbeville was a famous manufacture of broad cloth; and another at Louviers in Normandy. At the same place, and at Amiens, were manufactures of stuffs, worsteds, &c. and

[1] i. 569.

some

ſome of cotton. The manufactures of Orleans were ſtockings, and refined ſugar. At Chateau Roux another manufactory of broad cloths; and in the ſame neighbourhood large iron forges. At Limoges an hundred looms were employed in weaving druggets of hemp and wool; and the paper mills amounted to ſeventy. The large woollen manufactory at Cahors had declined; but thoſe of Montauban continued to flouriſh. At Montpellier were conſiderable manufactures of blankets and ſilk handkerchiefs; but thoſe of Niſmes were ſtill more important in ſilk, cotton, and thread: and at Gange was the chief manufacture of ſilk ſtockings in all France. The Londrins for the Levant were chiefly made at Beg-de-Rieux, and at Carcaſſonne. At Pau are large manufactures of linen. Tour has long been celebrated for ſilks. Beauvais, one of the moſt active towns in France, ſupplies tapeſtries and printed callicoes. The fabrication of plate glaſs at St. Gobin is well known as the firſt in Europe. In melting the glaſs beech wood only is employed, which is ſuppoſed to be the chief cauſe of its ſuperiority over that of England. At St. Quintin are made linen, cambric, and gauzes. Cambrics derive their name from Cambray; and the laces of Valenciennes have been long known. Liſle diſplays fine cloths and camblets. Mr. Young ſtyles Rouen the Mancheſter of France, being a town eminent in commerce, and in manufactures of velvet, and cotton cloths; and Caen boaſts of her ſilky fleeces. Bretagne in general has numerous manufactures of thread and linen. The fine cloths made at Louviere our author eſteems the firſt in the world, and at the ſame place is a large cotton mill. Rheims is remarkable for woollens. The ſilk manufactures of Lyons were eſtimated to employ 60,000 people, the looms being computed at 12,000. Iron manufactures flouriſhed at Nantes, Mont Cenis, St. Phillippe-en-foret, and ſeveral other places.

MANUFACTURES AND COMMERCE.

From this detail ſome idea may be formed of the commerce of France, for minute tables of which the reader is referred to Mr. Young's work, from which it appears that the chief imports are raw ſilk, wool, hemp, ſoda, and potaſh, raw hides, tallow, and timber; and the chief exports, manufactured ſilks, woollens, and linens of

 various

MANUFACTURES AND COMMERCE.

various kinds, gloves, ſkins, ſoap, oxen, ſheep, mules, and above all wines and brandies. By the account for 1784, which did not include the provinces of Lorrain and Alſace, nor the Weſt Indian trade, the ſtatement was

Total exports,	307,151,700 livres.
—— imports,	271,365,000
Balance,	35,786,700, or £ 1,565,668 ſterling.

The trade with the Weſt Indies gave a large balance againſt France, which in 1786 exported to the amount of more than 64,000,000 livres, but the imports exceeded 174,000,000. The average imports of France in 1788 were about twelve millions and a half ſterling, the exports nearly 15,000,000. The imports of Great Britain in the ſame year were about 18,000,000, the exports ſeventeen and a half[9]. Since the French revolution the commerce of England has been conſtantly on the increaſe; while that of our rival has been almoſt annihilated *.

[9] Young, 1. 520.

* Ample and authentic information upon theſe topics may be derived from the ſtatiſtic accounts of the ſeveral departments of France, now nearly complete. They will form one hundred and eight octavo pamphlets, moſtly written by the prefects themſelves, and certainly reflect credit on the government.

A minute account of the productions and manufactures of France is alſo given by M. Walckenaer, in a long and inſtructive note to his tranſlation of this work, vol. i. p. 126—150. As Lyons is celebrated for ſilks, Louvieres and Sedan for woollen cloths, ſo Straſburg for madder and tobacco. See Laumond Stat. du Bas-Rhin.

M. Donnant obſerves, that the ſilk manufacture was introduced by Louis XI. about the year 1470. The ſilk mills in France are about fifteen hundred, the looms about twenty-eight thouſand; beſides twelve thouſand for ribbons, lace and galloons, and forty thouſand for ſtockings; the whole ſilk manufacture occupying about two millions of people. The looms for woollens are about thirty-five thouſand; for cottons twenty-four thouſand. Abbeville fabricates ſails and broad cloths; Elbeuf, Louvieres, Sedan, broad cloths; Rouen linens; Bretagne linen, cordage, ſails; Berri linen; Auvergne laces, papers, (that of Annonay is celebrated;) Montpelier liqueurs; Langres cutlery; St. Quintin *batiſtes* or cambrics; Paris glaſs; Sevres porcelain. The beſt carpets are made at the Savonnerie in the village of Paſſy, near Paris. Joüy, near Verſailles, excels in printing linens; the manufacture is the property of a Swiſs, and is ſaid to occupy about twelve hundred men, women, and children.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes—Mountains—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of so extensive a kingdom as France, may be expected to be various. In general it is far more clear and serene than that of England; but the northern provinces are exposed to heavy rains, which however produce beautiful verdure and rich pastures [1]. The author quoted has observed, that rain is seldom so incessant in England, as not to present interruptions in the course of every day; while on the continent it flows unabated. He divides France into three climates, the northern, the central, and the southern. The first yields no wines; the second no maiz; the third produces wines, maiz, and olives. These divisions proceed in an oblique line from the S. W. to the N. E., so as to demonstrate "that the eastern part of the kingdom is two and a half degrees of latitude hotter than the western, or if not hotter more favourable to vegetation." The central division, Mr. Young considers as one of the finest provinces in the world, containing among others the district of Touraine, which the French particularly celebrate, yet it is exposed to violent showers of hail. The chief disadvantage of the third climate is the flies. "They are the first of torments in Spain, Italy, and the olive district of France: it is not that they bite, sting, or hurt, but they buz, teaze, and worry: your mouth, eyes, ears, and nose, are full of them: they swarm on every eatable, fruit, sugar, milk, every thing is attacked by them in such myriads, that, if they are not driven away incessantly by a person who has nothing else to do, to eat a meal is impossible." One great advantage of the climate of France

[1] Young's France, i. 309.

 arises

Climate and Seasons.

arifes from its being adapted to the culture of the vine, which flourifhes in fpots that would otherwife be wafte.

Face of the Country.

The face of the country is generally plain; and the only mountains deferving of the name are found in the South, in Auvergne and Languedoc, Dauphiné and Provence. Brittany correfponds greatly in appearance with Cornwall, and abounds in extenfive heaths *. In Lorrain are found the Mountains of Vofges, far inferior to the fouthern elevations. For beauty Mr. Young prefers the Limofin to any other province of France; yet much of the kingdom is finely diverfified with hill and dale, and the rivers, particularly the Seine, are often grand and picturefque.

Soil and Agriculture.

The variations of the foil have been ably illuftrated by the fame fkilful farmer [1]. The N. E. part from Flanders to Orleans is a rich loam. Further to the W. the land is poor and ftoney; Brittany being generally gravel, or gravelly fand, with low ridges of granite. The chalk runs through the centre of the kingdom, from Germany by Champagne to Saintonge; and on the N. of the mountainous tract is a large extent of gravel, probably wafhed down in primeval times; but even the mountainous region of the fouth is generally fertile, though the large province formerly called Gafcony prefent many *landes*, or level heaths.

The fame writer has ably illuftrated the defects of French agriculture, which cannot be more effectually expofed than in his own words. "In order the better to underftand how the great difference of product between the French and Englifh crops may affect the agriculture of the two kingdoms, it will be proper to obferve that the farmer in England will reap as much from his courfe of crops, in which wheat and rye occur but feldom, as the Frenchman can from his, in which they return often.

* The marfhes of La Vendée form a fingular and rare feature in France, and contributed a natural refuge to the prolongation of the civil war. For an animated defcription, the reader may confult Walckenaer, i. 137.

[1] Young's France, i. 296.

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SOIL AND AGRICULTURE.

An Engliſh courſe.		A French courſe.	
1, Turnips		1, Fallow	
2, Barley		2, Wheat	18
3, Clover		3, Barley, or oats	
4, Wheat	25	4, Fallow	
5, Turnips		5, Wheat	18
6, Barley		6, Barley, or oats	
7, Clover		7, Fallow	
8, Wheat	25	8, Wheat	18
9, Tares or beans		9, Barley, or oats	
10, Wheat	25	10, Fallow	
11, Turnips		11, Wheat	18
	75		72

"The Engliſhman in eleven years gets three buſhels more of wheat than the Frenchman. He gets three crops of barley, tares, or beans, which produce nearly twice as many buſhels per acre, as what the three French crops of ſpring corn produce. And he further gets at the ſame time three crops of turnips, and two of clover, the turnips worth 40s. the acre, and the clover 60s.; that is 12l. for both. What an enormous ſuperiority! More wheat; almoſt double of the ſpring corn; and above 20s. per acre, per annum, in turnips and clover. But further, the Engliſhman's land, by means of the manure ariſing from the conſumption of the turnips and clover, is in a conſtant ſtate of improvement; while the Frenchman's farm is ſtationary. Throw the whole into a caſh account, and it will ſtand thus:——

Engliſh Syſtem.	£.	s.	d.
Wheat 75 buſhels at 5s.	18	15	0
Spring corn three crops at 32 buſhels, 96 buſhels at 2s. 6d.	12	0	0
Clover, two crops.	6	0	0
Turnips, three crops	6	0	0
	42	15	0
Per acre, per annum	3	17	8

French Syſtem.	£.	s.	d.
Wheat 72 buſhels at 5s.	18	0	0
Spring corn, three crops at 20 buſhels, 60 buſhels, at 2s. 6s.	7	10	0
	25	10	0
Per acre, per annum	2	6	4

"In

Soil and Agriculture.

"In allowing the French ſyſtem to produce twenty buſhels of ſpring corn, while I aſſign thirty-two only to the Engliſh, I am confident that I favour the former conſiderably; for I believe the Engliſh produce is double of that of France: but ſtating it as above, here are the proportions of forty-two on an improving farm, to twenty-five on a ſtationary one; that is to ſay, a country containing 100,000,000 acres produces as much as another whoſe area contains 168,000,000, which are in the ſame ratio as thirty-ſix and twenty-five[3]." For ample and numerous illuſtrations of the defects of the French ſyſtem, the reader is referred to the ſame uſeful publication. In ſome of the provinces, however, the plans of agriculture correſpond with the natural fertility of the ſoil; and others diſplay a moſt laudable induſtry. A ſtriking inſtance of the latter is the artificial fertility conferred on ſome of the barren mountains of the Cevennes[4]. As the waters which run down the ſides carry conſiderable quantities of earth into the ravines, walls of looſe ſtones are erected, which permit the waters to paſs when they are clear; but when turbid their load of earth is gradually depoſited againſt the wall, and affords a ſpace of fertile ſoil. Succeſſive ramparts are thus erected to the very top of the mountain; and the water, having no longer a violent fall, only ſerves to nouriſh the crops, which are moreover protected by planting fruit trees at certain intervals, ſo as to lend ſecurity and conſiſtence to the new acquiſition. By another proceſs calcareous mountains, which generally riſe in ſhelves, are rendered productive by cutting away the rock behind the ſhelf, which ſupplies materials for a low wall around the edge. The interval is afterwards filled with earth, and the barren mountain is crowned with luxuriant terraces.

Wines.

One of the moſt precious products of France is its wines, which are, in general, ſuperior to thoſe of any other country, and reputed among the luxuries even of thoſe countries, which abound in valuable vineyards. The ſouth-weſtern diſtricts produce what we call claret, which is by the French phyſicians ranked among the cold wines. The beſt vineyards are thoſe of La Fitte and Chateau Margot. The wines

[3] Young's France, i. 357. [4] Nicholſon's Journal, iii. 295.

of

of Champagne, the rose-coloured and the white, are rendered frothy and sparkling by art. Those of Burgundy, Clos-Vaugeot, Volnay, Pomard, Beaune, Macon, &c. are the most healthy ordinary wines, of a warm, generous, and invigorating quality. But an Englishman, accustomed to the supposed grape of Oporto, will find the elegant and healthy wines from the banks of the Rhone, more agreeable to his habits and constitution; that of Donzere being nearly equal in strength, and far superior in flavour to port, while that of Savasse is milder; but the best, perhaps, is that of Rochemaure. The Tavel is of a beautiful transparent red, and is said to resemble that of Shiraz in Persia, the taste is peculiar and singularly pleasing. Those of Hermitage * and Côte Rotie are well known. Among the white wines of this part of France that of Frontignan, which we call Frontiniac, is well known for its rich and peculiar flavour, while the St. Pairet deserves mention for its singularity, being of an agreeable relish and tolerable strength, though in colour not distinguishable from water. Wines.

The rivers of France form the next object of consideration; and among these four are eminent, the Seine, the Loire, the Rhone, and the Garonne. The first is one of the most beautiful streams of France, rising near Saint Seine, in the modern department of Côte D'Or, a portion of ancient Burgundy, it pursues its course to the N. W. till it enter the English channel at Havre de Grace, after a course of about 250 English miles. It may here be remarked that the length assigned to rivers is not calculated with exactness, a work of infinite and uncertain labour, but merely affords a comparative scale, to judge of the relation, which the course of one river bears to another. Rivers. Seine.

The Loire derives its source from Mont Gerbier in the N. of ancient Languedoc; and after a northern course turns to the west, entering the ocean a considerable way beyond Nantes, after a course of about 500 miles. Loire.

The Rhone springs from the Glacier of Furca, near the mountain of Grimsel in Swisserland; and after passing the beautiful vales of the Rhone.

* Near Tain on the Isere.

Vallais,

Rivers. Vallais, and the lake of Geneva, bends its course towards the south, and enters the Mediterranean. The comparative course 400 miles.

Garonne. The Garonne rises in the vale of Arau in the Pyrenees. The course of this river is generally N. W. It extends to about 250 miles. After its junction with the Dordogne, it assumes the name of the Gironde.

The Seine is almost universally pleasing and picturesque; and the Loire presents noble features from Angiers to Nantes, but the rest of its immense course is disfigured with rough gravel [5]. The Garonne generally pervades a flat country, and is tamely fringed with willows. The Rhone is a noble and rapid stream.

France is adorned and enriched with many rivers of smaller course, and reputation; as the Saone which joins the Rhone near Lyons; the Lot and Dordogne which join the Garonne; and the numerous tributary streams of the Loire. The uncertainties of time and war as yet prevent the geographer from regarding the Meuse and Moselle, and even the Rhine, as rivers of France.

Lakes. A few small lakes occur in Provence, and perhaps in some of the other provinces, but only adapted to the minute description of the topographer, France and Spain being singularly deficient in this pleasing feature of landscape *.

Mountains. Before proceeding to the grand chain of mountains in the S. of France, it may be proper briefly to mention a few mountainous tracts in the north. Those of Brittany are granitic and primitive, but like those of Cornwall of small elevation. They divide into branches towards Brest and Alençon. The Vosges †, in the department of that

[5] Young's France, i. 305.

* Some small but picturesque lakes occur among the Vosges, as the Lac Blanc near Poutroye, and those of Gerardmer and Longemer. Sivry, Obs. Min. sur les Vosges, Nancy, 1782, 8vo. p. 62. 203. The river La Vologne yields pearls. Ib. 109.

† The mountains of Vosges, and the district to the east, are by the Germans called the Hundsruck. If the French extend their boundaries to the Rhine, this interesting portion of Germany will form a valuable accession, including not only a great part of the Palatinate, with the cities of Mentz, Wurms, and Spire, but the countries of Simmern, Sponheim, Oberstein, Birkenfeld, and Zweybrucken, constituting the important duchy of that name, more generally called Deux Ponts, supposed to contain 180,000 inhabitants, and yielding a revenue of 500,000 florins. Considerable chains of mountains appear on the W. and E. of Deux Ponts, remarkable for mineral productions, especially mercury, and beautiful agates.

name,

name, in the S. of ancient Lorrain, are ſuppoſed to be be connected with the mountains of Swiſſerland [6]. MOUNTAINS.

Mont Jura, a vanguard of the Alps, forms a boundary between France and Swiſſerland. If Mont Blanc be admitted among the French mountains, the other Alps cannot rival its ſupreme elevation. The ancient province of Dauphiné diſplays ſeveral alpine branches, which alſo extend through great part of Provence. Mont Jura.

To the weſt of the Rhone ariſes the grand chain of the Cevennes, which have been deſcribed by a recent author [7]. He obſerves that the Cevennes ſeem the principal centre of the primitive mountains of France, extending into ſeveral branches. The principal branch runs along the river Ardeche towards Ales. 2. Another traverſes the Rhone on the ſide of Tournon and Vienne, towards the plains of Dauphiné. 3. That forming the mountains of Beaujolois, paſſing by Tarare, Autun, &c. till it be loſt at Avalon. This branch is about 70 leagues in length, but in breadth ſometimes not more than a league: it contains the copper mines of Cheſi and St. Bel, and ſome lead mines. Coal is alſo found in the declivities. 4. The branch which, ſeparating the baſon of the Loire from that of the Allier, forms the mountains of Forez. It paſſes Roanne on the one ſide, and Thiers on the other, and is loſt towards St. Pierre le Moutier. The plain of Montbriſſon is bounded by theſe third and fourth granitic branches. 5. That which, ſeparating the baſon of the Allier from that of the Cher, paſſes by Clermont to Montluçon. 6. That ſtretching towards Limoges, 7. That from the Dordogne towards the Charente. 8. That dividing the Dordogne from the Garonne. Cevennes.

This account is not a little confuſed, as here are abundant branches without one trunk. The grand chain of the Cevennes runs from N. to S., and ſends out branches towards the E. and W. In the modern departments of the upper Loire and Cantal, are appearances

[6] Lameth. Theo. de la Ter. iv. 384. In the valley of Plancher les Mines is found green granite, a rare ſubſtance, of which tables and other ornamental articles are made at Paris. The higheſt mountain is about four thouſand three hundred feet above the level of the ſea.

[7] Ibid.

 which,

Mountains. which, in the opinion of eminent naturaliſts, indicate ancient volcanoes; but as theſe ſuppoſed appearances conſiſt chiefly of baſaltic columns, and elevations, ſome conſider them as having no claim to a volcanic origin. This ſubject remains dubious: as pretended lavas may be particular ſtones in a ſtate of decompoſition *. Yet the numerous exiſting volcanos in South America, ſuppoſed by many to have been a more recent continent, will compel the impartial inquirer, who will ſhun any excluſive ſyſtem, to allow that many extinct volcanoes may exiſt; but he never will grant that baſaltic columns afford the ſmalleſt preſumption of a volcano, as they rarely appear in the neighbourhood of exiſting volcanoes, and are ſometimes found reſting on coal, which in caſe of fire muſt have been totally conſumed. The rocks of Puy, Axpailli, and Polignac, riſe in ſudden and groteſque forms; but theſe appearances are ſometimes aſſumed even by granite, as may be obſerved in Cornwall. The baſaltic mountains of the ancient province of Auvergne are likewiſe too extenſive to be produced by a ſingle volcano, and a chain of volcanos would be too bold even for conjecture. The northern part of the chain is ſtyled the Puy de Dome, while the ſouthern is called that of Cantal †. The Monts D'Or form the centre, and are the higheſt mountains in France. The chief elevation is that of the Puy de Sanſi, which riſes about 6,300 feet above the level of the ſea, while the Puy de Dome is about 5000, and the Plomb du Cantal, the higheſt of that part, is about 6,200 feet. Near the Puy de Sanſi is l'Ango, that gigantic mountain, and Ecorchade a ſhattered and wrecked elevation. The Plomb du Cantal is alſo accompanied by bold rivals, as the Puy de Griou, le Col-de-Cabre, le Puy Mari, and the Violent. This enormous aſſemblage of rocks covers an extent of about 120 miles, and according to the French authors is

* The author has ſince received a conſiderable collection of ſpecimens from this part of France, and entertains no doubt that they are volcanic. M. Daubuiſſon, a diſciple of Werner, and a confirmed Neptuniſt, was equally convinced, in ſpite of all his ſcepticiſm, after an actual viſit to the country. M. de Buch, a Pruſſian naturaliſt, was equally convinced by a viſit to the ſpot, and ſays the Puy de Dome is a granite, elevated and changed by ſubterranean vapours. See J. d. M. No. 76. Nor can aſſent be eaſily refuſed to the chief of orogoliſts, Sauſſure, who has publiſhed, in the *Journal de Phyſique*, an account of an extinct volcano in the Briſgau.

† Voy. dans les Depart. Cantal, p. 5.

 chiefly

chiefly baſaltic. The Puy de Sanſi is capped with almoſt perpetual ſnow, followed in the deſcent by naked rocks and ancient pines: from its ſide iſſues from two ſources, the river Dordogne, and many pictureſque caſcades devolve amidſt baſaltic columns [9]. On the 23d of June, 1727, Pradines, a village on the ſlope of one of theſe mountains, was totally overwhelmed by its fall, the whole mountain, with its baſaltic columns, rolling into the valley. The inhabitants were fortunately engaged in the celebration of midſummer eve, around a bonfire at ſome diſtance [10]. Theſe mountains are in winter expoſed to dreadful ſnowy hurricanes, called *acirs*, which in a few hours obliterate the ravines, and even the precipices, and deſcending to the paths and ſtreets, confine the inhabitants to their dwellings, till a communication can be opened with their neighbours, ſometimes in the form of an arch under the vaſt maſs of ſnow. Wretched the traveller who is thus overtaken. His path diſappears, the precipice cannot be diſtinguiſhed from the level; if he ſtand he is chilled, and buried if he proceed; his eye-ſight fails amidſt the ſnowy darkneſs; his reſpiration is impeded; his head becomes giddy, he falls and periſhes. In ſummer, thunder ſtorms are frequent and terrible, and accompanied with torrents of large hail, which deſtroy the fruits and flocks, which for ſix months paſture on the mountains, guarded by ſhepherds, who have temporary cabins of turf and reed, ſtyled *burons*. Mountains.

The Pyrenees remain to be deſcribed. This vaſt chain, known and celebrated ſince the days of Herodotus, may be conſidered with equal juſtice as belonging either to France or to Spain; but as the moſt productive and intereſting parts are on the ſide of France, and her literati have exerted themſelves in the deſcription, while thoſe of Spain have been ſilent, it ſeems at leaſt equally proper to introduce the delineation here, which ſhall be chiefly derived from the recent accounts of Ramond and Lapeyrouſe [11]. To the ſurprize of naturaliſts, the Pyrenees Pyrenees.

[9] Voy. dans les Depart. Cantal, p. 13.

[10] Voy. dans les Depart. Cantal, p. 24. One vaſt block of ſtone, 90 feet long and 26 thick, being too heavy to roll, ſunk vertically, and the ſhock ſeemed an earthquake even at the diſtance of a league. Another mountain is ſaid to have recently ſunk and diſappeared in the S. of France.

[11] Journal des Mines, No. 37, p. 35.

Pyrenees. have been found to prefent calcareous appearances, and even fhells, near or upon their higheft fummits, which are in the centre of the chain. Mont Perdu is confidered as the higheft elevation of the Pyrenees, afcending above the fea 1751 French toifes, or about 11,000 feet Englifh. The Canigou formerly ufurped that honour though it exceed not 1440 toifes. Other noted heights are Tuccarroy, Marboré, the pic de Midi, the pic d'Arni, the Niege Veille, the Vigne Male, La Breche de Roland, &c. *. The Pyrenean chain appears at a diftance like a fhaggy ridge, prefenting the fegment of a circle fronting France, and defcending at each extremity till it difappear in the ocean and Mediterranean [12]. Thus at St. Jean de Luz only high hills appear, and in like manner on the eaft, beyond the fummit Canigou, the elevations gradually diminifh. The higheft fummits are crowned with perpetual fnow. Blocks of granite are interfperfed with vertical bands, argillaceous and calcareous, the latter primitive or fecondary, and fupplying the marbles of Campan and Antin, of beautiful red fpotted with white, though the general mountain mafs be grey. To the S. and W. the Pyrenees prefent nothing but dreadful fterility, but on the N. and E. the defcent is more gradual, and affords frequent woods and paftures. Befides the dreadful fall of rocks, undermined by the waters, they are expofed to Lavanges, or the impetuous defcent of vaft maffes of fnow, called Avalanches in Swifferland, and have their glaciers and other terrific features of the Alps.

Mont Perdu. According to Ramond [13] the very fummit of mount Perdu abounds with marine fpoils, and muft have been covered by the fea; an obfervation confirmed by Lapeyroufe. This mountain is of very difficult accefs, as the calcareous rock often affumes the form of perpendicular walls, from 100 to 600 feet in height; and the fnows, ice, and glaciers, increafe the difficulty; nor did thefe naturalifts attain the fummit, though they could obferve that the rock correfponded in form and nature with thofe which they afcended. A fingular feature of the Pyrenees confifts of what are called *houles*, or walls difpofed in a circular

* See in the fame Journal, No. 46, p. 757, an eftimate of other Pyrenean elevations.

[12] Voy. dans les Dep. No. 67, p. 4. [13] Journ. des Min. ut fupra.

 form.

form. Near the ſummit of Mont Perdu is a conſiderable lake, more than 9000 feet above the level of the ſea, which throws its waters to the eaſt into the Spaniſh valley of Beouſſa; and which the travellers conſider as a proof that Mont Perdu really belongs to Spain, and that Tuccarroy forms the boundary. The beſt maps of the Pyrenees are erroneous, as this lake has no connection with the noted caſcades of Marboré, which flow from another lake to the weſt; and Lapeyrouſe has pointed out other groſs miſtakes in the topography of this intereſting diſtrict. He adds that it is probable that the ſole acceſs to the ſummit of Mont Perdu will be found on the ſide of Spain, there being three ſummits called by the Spaniards *Las Tres Sorrellas* or the Three Siſters; the higheſt being to the north, and the loweſt on the ſouth, but ſeparated, as would appear, by large glaciers. From this view of the Pyrenees, Lapeyrouſe concludes that there exiſt chains of mountains, in which bands of granite, porphyry, trap, hornblende, and petroſilex, alternate vertically with primitive limeſtone, and are ſo intermingled as to prove a common origin. But in the Pyrenees theſe bands are ſurmounted by ſecondary limeſtone, replete with marine ſpoils, and containing even ſkeletons of animals, ſo that he concludes that the higheſt mountains of the chain muſt have yielded to the fury of the ocean, and that the ſecondary parts alone now exiſt. Mr. Townſend [14] obſerves, that the limeſtone and ſchiſtus feed the vegetation on the N. of the Pyrenees, while the ſouth is barren and conſiſts of granite; while, in fact, mountains are generally barren and precipitous on the S. and W. becauſe the moſt violent rains and tempeſts come from thoſe regions. Yet this brief account of the Pyrenees muſt be cloſed with the obſervation, that while Sauſſure has explained with ſedulous ſkill the ſubſtances which compoſe the Alps, there is no work concerning the Pyrenees of great reſearch, or patient inveſtigation *.

Mont Perdu.

[14] Spain, i. 89.

* M. Ramond has ſince viſited the ſummit of Mont Perdu, and found it to conſiſt of a black fetid limeſtone or marble, in which ſand may ſometimes be obſerved. The height is 1763 fathoms, or, 10,578 feet. Journal des Mines, No. 83. He ſhewed to the author at Paris a noble collection of botany of the Pyrenees, which he is about to publiſh. The central line of the Pyrenees is granite; but the far ſuperior elevation of the limeſtone forms a ſingular feature. The granite is white, as in the Alps, and moſt of the grand chains of mountains.

The

Forests. The forests of France are numerous and extensive; and as wood is the general fuel, attention to their growth becomes indispensable. Two of the most remarkable are those of Orleans and Ardennes, the former for extent and the numerous troops of banditti who used to invest its precincts; the latter for ancient fame and events of chivalry. The forest of Ardennes extended from Rheims to Tournay, and on the N. E. to Sedan in the present department of the Ardennes. To these names might be added the forest of Fontainbleau, and many others, which here to enumerate would be superfluous, as almost every seigneur had his forest, in which he passed the greatest part of his life among his brethren the wild beasts [15].

Botany. Notwithstanding the pains that have hitherto been bestowed by French naturalists in illustrating the flora of their native country, it still remains in an imperfect state: particular districts, as the environs of Montpellier, of Lyons, and of Paris, have been surveyed with considerable accuracy, but many chasms must yet be filled before a comprehensive history can be made out of the vegetable productions of France. So great indeed is its extent, and so various its climate, that probably more than half the European species of plants may be found within its boundaries. The bleak shores of the North, the fertile plains on the Belgian frontier, the rich vales of the Loire, the Rhone, and Garonne, the towering heights of Auvergne, the exterior ridges of the Alps and Pyrenees, the sunny exposure of the Mediterranean coast, offer such striking differences of soil and temperature, as evince at once a most abundant catalogue of indigenous plants. That country which produces in full and equal perfection wheat and apples, maiz and grapes, oranges and olives, the oak and the myrtle, must doubtless exceed all other European countries of equal extent in the variety and richness of its vegetable treasures. A bare enumeration of them would occupy more room than can be allotted to them in a work like the present. We shall therefore only particularize such as are the most generally interesting to the English reader.

[15] William of Malmsbury says that Rufus, the son of the Conqueror, established many forests and abodes for the wild beasts "whom he loved as if he had been their father."

If

If France be divided by imaginary lines from E. to W. into nearly four equal parts, the moſt northern of theſe diviſions will bear a conſiderable reſemblance in its climate and vegetable produce to the S. of England; the ſecond differs principally from the firſt in exhibiting here and there a few vineyards; in the third, fields of maiz begin to make their appearance; and the fourth is diſtinguiſhed from the preceding by intermixing groves of olive trees with its exuberant harveſts, and its overflowing vintages. BOTANY.

The ſouthern and eaſtern provinces of France, being thoſe which have been the moſt carefully explored, as well as containing the moſt intereſting plants, are chiefly referred to in the following liſt *.

The ſpecies belonging to the large family of compound flowers, are very numerous. Of theſe ſeveral are introduced at preſent into our flower gardens; ſuch are the *globe thiſtle*; ſeveral ſpecies of Centaurea, among others C. benedicta, *bleſſed thiſtle*; *lavender cotton*; *mountain ſouthernwood*, and *common ſouthernwood*, both of them plentiful on the rocks of Dauphiné and Provence. A few eſculent vegetables that grow wild in Languedoc and Provence, but are cultivated in our kitchen gardens, arrange themſelves alſo under this claſs; for inſtance, *artichoke*; *ſalſafy*; and *ſcorzonera*.

The cucumber, the melon, the gourd, and other kindred genera, though cultivated largely and with great eaſe in the South of France, are yet natives of hotter climates; only one of this natural family, the Momordica elaterium *ſquirting cucumber*, properly belongs to the French flora; it occurs in a truly wild ſtate, on low looſe rocks, in Provence and Languedoc.

Of the ringent or galeated plants, numerous ſpecies are natives of France, not many of which, however, have found their way into Engliſh gardens; the following are almoſt the whole that are in any requeſt for their beauty or uſe, all of which are natives of Languedoc, Provence, or Dauphiné: *prickly and ſmooth acanthus*; *Montpellier ſnapdragon*; *garden hyſſop*; *ſpike lavender*; *roſemary*; and *garden ſage*.

* Lamarck, Flore Françoiſe. Tournefort, Hiſt. des Plants, &c. Villar's, Hiſt. des Plants de Dauphiné. Durande, Flore de Bourgogne. Lindern, Hortus Alſaticus.

The

BOTANY. The nearer in general any country is ſituated to the tropics, the greater is the abundance and beauty of the bulbiferous or liliaceous plants that inhabit it: the South of France is particularly rich in theſe ſplendid and fragrant vegetables, ſeveral of which have been naturalized in our gardens, and conſtitute their principal ornament. Of the genus Allium *garlic*, no leſs than 36 ſpecies are natives of France, ſeveral of which have been admitted for their beauty into Engliſh flower gardens, of theſe the A. Monſpeſſulanum, *Montpellier garlic*, is perhaps the chief. The large *branched Aſphodel*, Aſphodelus ramoſus, a flower of great beauty and poetic fame, is by no means uncommon in Provence. Hemerocallis fulva, *tawny day-lilly*; Hyacinthus botryoides, *cluſtered hyacinth*; Ornithogalum pyramidale, *ſpiked ſtar of Bethlehem*, are all found in the Mediterranean provinces of France, as are alſo the *orange*, *pompadore*, and *martagon lillies*; *white hellebore*; *Narciſſus* and *Jonquil*. The ſhore of Hieres is adorned by the Pancratium maritimum, *ſea daffodil*, growing luxuriantly on the very beach; and on the lower cliffs of the Nicene and Genoeſe Alps, the gigantic Agave, *American aloe*, now naturalized to the ſoil and climate, raiſes her ſtately flower ſtem to the height of 20 or 30 feet, and looks down on every herbaceous plant of European origin.

Allied to the bulbiferous are the tuberous rooted plants with ſword-shaped leaves, ſeveral ſpecies of which are found in France; the moſt beautiful and worthy of notice are *corn flag*; abundant in the cultivated lands of the middle and ſouthern provinces; the Iris Germanica, in Alſace and on the German frontier; and Iris pumila and maritima, two elegant little plants that are occaſionally met with in Provence and Languedoc.

Of the papilionaceous plants that are natives of this country, ſeveral deſerve notice for their uſe or ornament. Lathyrus tuberoſus, a vegetable of the pea kind, grows wild in Alſace, and is cultivated in many parts of France for its large eſculent tuberous roots; the *great lupin*, varying with blue, white, or fleſh coloured bloſſoms, and the *chick pea*, are met with in the ſouthern provinces growing ſpontaneouſly, but are more frequently cultivated in large fields as food both for cattle and man; in England the former is conſidered merely as an ornamental plant, and is found

found in every flower-garden: *fenugreek*, esteemed for its medicinal virtues, and Astragalus tragacantha, *tragacanth vetch*, so named from the gum that it yields, are both natives of Provence and the vicinity of Montpellier. Many of our most ornamental shrubs belong to this class, such as Cytisus Laburnum, *great Laburnum;* Collutea arborescens, *bladder senna;* and Spartium junceum, *Spanish broom.* BOTANY.

Several succulent plants of the same natural class with the Sedum, are found on the dry rocks on the Spanish and Swiss frontiers; of which a few have been introduced into our gardens, viz. Sedum anacampseros and villosum, *ever-green orpine*, and *hairy sedum;* Sempervivum, globiferum, and arachnoideum, *hen and chicken sedum*, and *cobweb sedum.*

The class Pentandria of Linnæus contains several well-known plants that occur native in France, some of which have been introduced into our gardens and shrubberies; such are the *hairy primrose* and *auricula*, found wild on the mountains of Provence; *blue berried honey-suckle; rosebay oleander; great flowered campanula* and *Venus's looking-glass;* the *alaternus*, and *tamarisk.* Others of this class deserve notice for their use in various arts, and in medicine, as Pistachia terebinthus, *Chio turpentine-tree*, P. lentiscus, *mastich-tree;* Rhamnus infectorius, the berries of which are used in dyeing by the name of *French berries* or *graines d'Avignon; alkanet*, another dyeing drug; *common* and *Venetian sumach*, the most powerful vegetable astringents, and largely applied to leather dressing and dyeing; Salsola soda, *glass wort*, a plant growing on the shore of the Mediterranean, from which the Barilla of commerce is prepared. Some esculent plants also belong to this class, which, if not strictly natives of France, have at least been long naturalized to the soil and climate; these are *carob-tree; pistachia nut-tree*, and *jujube-tree.*

But few species of the French flora need be mentioned under the class Decandria Linn. The *fraxinella;* the *yellow* and *Narbonne flax;* the *sweet William* and *carnation;* the *ferruginous Rhododendron*, and *the Strawberry saxifrage*, are adopted into our flower gardens: the *Rue*, and *Storax-tree*, the former a native, and the other naturalized at Hieres, are used in medicine.

Botany. Many of the moſt beautiful plants of the claſſes polyandria and icoſandria are to be met with wild in France; ſuch are *ſcarlet-horned poppy; common and narrow-leaved peony; feathered columbine; Chriſtmas roſe and winter aconite; Alpine anemone and hepatica; bee larkſpur*, and *monkſhood*; ſeveral trees and ſhrubs both ornamental and uſeful, alſo arrange themſelves under one or other of theſe claſſes. The *broad-leaved myrtle*, grows with great luxuriance along the whole of the Mediterranean coaſt; the *Caper-buſh*, the *laurel-leaved* and *Montpellier ciſtus*, three low ſhrubs of exquiſite beauty, hang from the ſummits, or cluſter round the ſides of the low rocks about Toulon, and Montpellier. In the ſame vicinity alſo are found the *Provence roſe*, the *pyracantha*, and the *pomegranate tree*.

A few trees and ſhrubs remain to be mentioned, which will be more conveniently taken together than ſeparated into their botanical claſſes; theſe are, the *greater and leſs prickly-cupped oak*, two very fine ſpecies that are found in plenty about Paris and Fontainbleau; the *kermes oak*, *cork-tree*, and *evergreen ilex*, growing chiefly in the ſouthern provinces; the *ſavine*, the *brown and yellow berried juniper; broad leaved phillyrea*; and *tree-heath*; all of them natives of Provence, Dauphiné, and Languedoc *.

Zoology. The horſes of France do not appear to have been celebrated at any period; and it is well known that the ancient monarchs were drawn to the national aſſemblies by oxen. Before the late commencement of hoſtilities, many Engliſh horſes were imported for the coach and ſaddle. The beſt native horſes are, for draught, thoſe of Normandy; for the ſaddle, thoſe of the Limoſin, which have been recently improved by croſſing the breed with the Arabian, Turkiſh, and Engliſh [16]. But the greater number of horſes in France conſiſts of Bidets, ſmall animals of little ſhew, but great utility. The rich paſtures of the north ſupport

* To the French botany may be added the truffel, chiefly found in the Angoumois and Perigord, whence they are ſent to ſupply epicurean tables. They are commonly found in a ferrugenous ſoil, at the foot of the black oak; and it is ſaid, that the truffel diſappears if the tree be deſtroyed. There is alſo a reſemblance between the taſte of that wood, and that of the truffel. They are found by means of pigs, in the month of November. There is in Piedmont a ſuperior ſort, of a white colour, and which ſmells like garlick. *Walckenaer.*

[16] Young's France, ii. 55.

numerous

numerous herds of cattle, yet an able judge[17] asserts, that there is not in the kingdom one tenth part of what there ought to be; a radical error of French agriculture being the neglect of grass, and the consequent want of manure. The cattle of Limoges, and some other provinces, are of a beautiful cream colour. The beef at Paris, Mr. Young prefers to that of London. The sheep are ill managed, having in winter only straw, instead of green food as in England[18]. The consequences are poor fleeces, rarity of sheep, so that the poor are forced to eat bread only, and large quantities of wool are imported. Of ferocious animals the most remarkable are the wild boar and the wolf; the ibex, rock goat, or bouquetin, is found on the Pyrenees and the Alps, being a large goat with very long and strong horns. The chamois belongs to the class of antelopes, having small strait horns. Among the animals almost peculiar to France, may be mentioned the Vespertilio ferotina, Pipistrilla, Barbastella, the Otis tetrax, the Chadrius lutreus, &c. * Zoology.

Gold mines anciently existed in the S. of France, and some of the rivulets still roll down particles of that metal. The ancient Gallic coins are however of a base gold mingled with silver, being the metal styled by the ancients electrum. And such it is probable are the particles of gold which are found in the sands of the Rhone, between Tournon and Valance, and in those of the Ardeche[19]. France can, however, boast of the silver mines at St. Marie-aux-Mines in Alsace, and at Giromagny in the department of the Upper Rhine, near the mountains of Vosges, also a part of ancient Alsace. The same district contains mines of copper, a metal not unfrequent in the departments of the Alps, and Mineralogy. Gold. Silver. Copper.

[17] Young, ii. 52. [18] Young, i. 430.

* The castor, or beaver, is found in the isles of the Rhone, but is very different from that of America, being four times as large, and not constructing a hut, but digging a hole. The bear is found in Dauphiné and the Pyrenees; the latter also present the lynx, but rarely. Vipers abound in La Vendée; and, in the summer 1804, a new and pernicious sort was said to have killed some people in the forest of Fontainbleau.

The best mutton is that of the Ardennes. In Languedoc there are travelling flocks of sheep like the Mesta of Spain. See *Walckenaer*, i. 190.

[19] Journ. des Mines, An. vi. p. 662. Many other rivers of France roll gold, as appears from a memoir of Reaumur. The gold mine of Gardette, in Dauphiné, is of little consequence. There is also a silver mine at Chalanches, near Allemont in the same vicinity.

MINERALOGY.

those of the Loire, the Lozere, and the Ardéche *. Some appearances indicate tin in Bretagne, and even in the centre of France. Two thirds of the lead of France are from Bretagne, particularly the mines of Poullaoven and Huelgoet; mines of lead also occur in the maritime Alps, and in the mountains of Vosges, in the Departments of Lozere, Ardéche, &c. &c. Antimony occurs in the Ardéche, and in the department of the Allier, at Allemont in former Dauphiné, and in that of Mont Blanc, if that acquisition subsist. There are noted mines of calamine near Aix la Chapelle, if this may be considered as French territory. Manganese occurs in the department of the Loire, and in that of the Vosges; and at Romanechc, in the department of the Saone, and Loire; it is also found near Perigou, whence it is used to be called pierre de Perigord: Cobalt is another product of Alsace. The new acquisitions in Savoy present some mercury; and there is a mine at Menildot †.

Lead.

Iron.

Iron, that most important and universal of metals, is found in abundance, particularly in some of the northern departments. The iron

* The chief copper mines are those of Chesy and St. Bel. See Walck. i. 195.; but the position which he assigns, is one of the numerous inaccuracies which are so much to be regretted in his work.

† The duchy of Deux Ponts, a valuable acquisition of France on the west of the Rhine, has long been celebrated for mines of quicksilver. The mountains of Vosges are chiefly horizontal strata of red sand-stone. Near Gelheim, to the west of Wurms, the chain is interrupted; but afterwards rising spreads in two branches, that to the W. being called Westrich, that to the E. Donnersberg. (Journal des Mines, No. 6. p. 70.) The mountains which contain the mercury embrace a district of ten or twelve leagues in length, S. to N. from Wolfstein to Cruznach, and seven or eight leagues in breadth, being of a reddish brown or grey sand-stone. In this territory, among numerous mines of quicksilver, are those of Stahlberg, and Donnersberg, which have been explored for many centuries. The gangart is steatite, barytes, argillaceous rock, &c. The adjacent part of the Palatinate also contains similar mines, particularly in the mountain of Potzberg near the river Glan, composed of a kind of substance like kaolin, of minute particles of quartz, mica, and clay. The pits in Potzberg are about forty. At Wolfstein are other mines of the same rare mineral. The annual product of these mines may be estimated at 67,200 pounds of mercury; and the revenue, after deducting expences, at 127,517 livres. Near Trarbach, at the extremity of the western branch of the Vosges, there are mines of copper and lead, with some silver. (Ib. xi. 43, &c.) About six miles to the south of Trarbach, the mountain Eckelsberg displays singular picturesque walls of quartz, running from E. to W., the intermediate schistus being decayed. Many parts of the Hunzruck, or region between the Mozelle and the Nahe, are covered with blocks of quartz.

mines

mines of Framont, which afford beautiful ſpecimens, are at the foot of Donon the higheſt of the Voſges. In 1798 it was computed that there were 2000 furnaces, forges, &c. for the working of iron and ſteel[20]. MINERALOGY.

The coal mines of France were, at the ſame time, eſtimated at 400, conſtantly wrought; and 200 more capable of being wrought. Of theſe coal mines many occur in the provinces which formerly belonged to Flanders, and in the departments of Boulogne, and Lamanche. Coal is alſo not unfrequent in the centre and ſouth of France. Nearly allied to coal is jet, an article formerly of great conſumption, chiefly in Spain, where it was made into roſaries, croſſes, buttons for black dreſſes, &c.[21] France was from time immemorial in poſſeſſion of this branch, which was centered in three villages in the department of the Aude, in the S. W. of ancient Languedoc. In 1786 it employed more than 1200 workmen; and the annual ſupply of the mineral was computed at a thouſand quintals, or hundred weight. Beſides exports to Germany, Italy, and the Levant, Spain imported theſe jet manufactures to the annual amount of 180,000 livres. Latterly jet was, in return, imported from the mines of Arragon in Spain, to ſupply this manufacture. That in the S. of France is in beds like coal, but not continuous, and was ſometimes rendered impure by a mixture of pyrites: it is commonly found in a kind of ruſty earth, of an aſh colour; and ſometimes occurs in maſſes of the weight of 50lbs, about five or ſix fathom under the ſurface. Coal.

Beſides excellent freeſtone, the environs of Paris contain abundance of gypſum, which at Mont Martre is found curiouſly cryſtallized. Alum is found in conſiderable quantities at Aveyron. The Pyrenees in particular ſupply beautiful marbles; and the extenſive and various territories of France afford ſeveral precious ſtones, as the aqua marina, the jacinth, the chryſolite, and even the ſapphire.

The chief mineral waters of France are thoſe of Barrèges and Bagneres, in the Pyrenees, both reſembling thoſe of Bath, Forges, in Normandy, Mineral Waters.

[20] Journ. des Mines, Ann. vii. p. 171. [21] Ibid. Ann. iii. No. 4. p. 41.

ferru-

Mineral Waters.

ferruginous, Vichi, Bourbonne, Balaruc, Plombieres *. The warm baths of Barrèges, in particular, at the foot of the Pyrenees, have been long celebrated, and there the Queen of Navarre lays the ſcene of her tales. The baths of Bagneres are in the ſame neighbourhood.

Natural Curioſities.

Among the natural curioſities of France, or thoſe objects which, in an enlightened age, attract particular obſervation, may be named the ſingular mountains of Auvergne already mentioned, and which ſtruck even Mr. Young as volcanic. The ſcenery here is however richly deſerving of attention; and has eſcaped moſt travellers, who have purſued the dull route to Dijon, inſtead of this variegated road which may conduct them by Niſmes, and Aix, into Italy. The fountain of Vaucluſe, celebrated by Petrarca, is a river ſpringing ſuddenly from a cavern at the bottom of a perpendicular rock. Nor muſt the noted plain of La Crau be forgotten, which lies in Provence, not far from the mouth of the Rhone. This is the moſt ſingular ſtony deſert that is to be found in France, or perhaps in Europe [22]. The diameter is about five leagues, and the contents from 20 to 25 leagues ſquare, or about 150,000 Engliſh acres. It is entirely compoſed of ſhingle, or round gravel, ſome of the ſtones as large as the head of a man, and the ſhingle of the ſea-ſhore is not more barren of ſoil. Beneath is a ſmall mixture of loam with fragments of ſtone. In the winter there are ſcattered piles of graſs, which, from the vaſt extent of the ſpace, paſture a conſiderable multitude of ſheep. Mont St. Michael in Normandy is another natural curioſity, being a ſolitary hill riſing near the ſea, like St. Michael's mount in Cornwall. In general however France, being moſtly a plain country, does not preſent much ſingularity of feature; and the ſcenes of the Cevennes and Pyrenees have been little explored by travellers, who paſſing to the chief cities generally ſee only the moſt unintereſting parts of the country. Even Bretagne, it is probable, may preſent many ſingularities, which may have eſcaped the attention of the French themſelves, who do not appear to be much impreſſed with ſuch objects. They

* The deobſtruent waters of Plombieres are called *Savonneuſes* or ſoapy, by the French. They are impregnated with ſteatite or magneſia. There are alſo mineral waters at Mont D'Or in Auvergne.

[22] Young, i. 379.

have,

have, however, commemorated with ſome attention various natural caves, which in France, as in other countries, preſent themſelves in calcareous rocks. One near the village of Beaume, about ſix leagues from Beſançon, is remarkable from its containing a glacier; and it was fabulouſly reported that the ice increaſed during the ſummer, and diminiſhed in the winter, till recent obſervations evinced, as was to be expected, the contrary poſition [23]. This cave is at the bottom of a ſmall valley in the midſt of a thick foreſt. The mouth, which is level with the vale, is forty-five feet broad; and after a long and ſteep deſcent appears a hall of 100 high, whence there is a paſſage to the chamber containing the glacier, the deſcent to which is by a ladder of forty feet. In this triangular cavern are vaſt ſtalactites of ſolid ice, which are ſometimes nearly joined by pillars of the ſame material, riſing from a magnificent pedeſtal on the floor. While the thermometer of Reaumur, placed without, was at 20 degrees and a half, it here fell to one and three quarters. This phænomenon may be partly owing to the direction of the aperture of the cave, which fronts the north. NATURAL CURIOSITIES.

The noted wonders of Dauphinè compriſe many Alpine ſcenes. In the department of Ardéche, on the other ſide of the Rhone, are ſeveral natural curioſities, ſuch as the bridge of rock, under which the river Ardéche paſſes, near the village of Chames, the grottoes of Vallon, the gulph of Goule, with many ſingular baſaltic columns, cauſies, &c. and what the French authors ſtyle craters of volcanoes [24]. The cataract of Gavarnie in the Pyrenees is ſaid to fall 1266 feet, being the higheſt in Europe.

[23] Journ. des Mines, xxi. 65.

[24] Ibid. Ann. vi. p. 626. To theſe may be added the caves of Arcy, near Vermanton, in the former province of Burgundy, and other curious grottos on the river Cher, three leagues on the ſouth weſt of Tours. In the county of Foix, the junction of two mountains, forms a cavern, capable of containing two thouſand men; nor among the natural curioſities ſhould be forgotten the banks of ſhells in entire preſervation found in Burgundy, and at Grignon, not far from Verſailles. See Faujas *Eſſai de géologie*, vol. i. Paris, 1803, 8vo. The ſtones which have recently fallen from the atmoſphere, near Aigle, in Normandy, may alſo be ranged in this claſs. Like those of the ſame deſcription, which have fallen in England, Italy, Germany, and Hindoſtan, they contain iron, flex, magneſia, and nickel, a compoſition before unknown on the globe. See Izarn's work, and the Italian publication dedicated to the Earl of Briſtol. See alſo Cardan. *de Var. Rer.* who mentions a ſhower of 1200 ſtones which fell in Lombardy in 1510.

French Isles.

Corſica.

The iſles around France are ſo ſmall, and unimportant, that they would ſcarcely be deſerving of notice, were it not for events that have taken place during this war. The iſle of Corſica muſt however be excepted, if it continue to be regarded as a part of the French territory. From the dominion of Carthage, this iſle paſſed under that of Rome, and was for ſome time ſubject to the Saracens of Africa. In the time of the cruſades it was aſſigned to the republic of Piſa, and was afterwards conquered by the Genoeſe. In 1736 the malcontents rejected the Genoeſe yoke, and choſe a German adventurer for their king. After many ineffectual ſtruggles Corſica was ceded to the French, who continue to maintain a dubious authority. The Romans did not certainly highly eſteem this iſland, when they ſelected it as a place of exile; and according to a modern French geographer, "the air of Corſica is thick and unwholeſome, the territory full of mountains, of little fertility, and ill cultivated: the vallies nevertheleſs produce corn, and the hills wine, fruits, and almonds[25]." This plain account ſeems preferable to the exaggerations of party writers in England, who ſwell the advantages of this iſland; but it is probable that, as they aſſert, ſmall veins of ſilver may be found, and that the mountains may afford granite, porphyry, jaſper, &c. which however abound in the Highlands of Scotland *.

The iſles called Hyeres, near Toulon, have been equally magnified by a female traveller. Mr. Young informs us, that they have a barren and naked appearance, and only preſent ſome melancholy pines[26]. They however contain ſome botanic riches, and may claim the fame of being Homer's iſle of Calypſo.

On the weſtern coaſt firſt occurs the iſle of Oleron, about fourteen miles long by two broad, celebrated for a code of maritime laws iſſued

[25] La Croix, i. 528.

* Volney, in his View of the American States, informs us that, during the three months he reſided in Corſica, there were one hundred and eleven aſſaſſinations, ariſing from private revenge. He alſo indicates the chief cauſe of the want of civilization to be, that the land is moſtly public property, and the fewneſs of private poſſeſſions. The firſt ſtep ought to be, to divide the country into hereditary eſtates of a moderate ſize.

[26] France, i. 195.

by

by Richard I, king of England, of whose French territory this isle constituted a portion. To the N. is the isle of Ré, opposite Rochelle, noted for an expedition of the English in the seventeenth century, described by Lord Herbert of Cherbury. Yeu is a small and insignificant isle, followed by Noirmoutier, which became remarkable in the war of La Vendeé, being about eight miles long and two in breadth. Bellisle has been repeatedly attacked by the English: it is about nine miles long and three broad, surrounded by steep rocks, which, with the fortifications, render the conquest difficult. The isle of Ushant, or Ouessant, is remarkable as the furthest headland of France, towards the west, being about twelve miles from the continent, and about nine in circumference, with several hamlets, and about 600 inhabitants. Several other small isles may be passed in silence, but those of St. Marcou, about seven miles S. E. of La Hogue, may be mentioned as having been in our possession: they received their name, it is believed, from a Norman Saint, Marcoul, abbot of Nantouille, who died in 558.

French Isles.

NETHERLANDS.

Names. — Extent. — Original Population. — Historical Epochs. — Antiquities. — Religion. — Government. — Laws. — Population. — Revenue. — Political Importance and Relations. — Manners and Customs. — Language. — Literature. — Education. — Universities. — Cities and Towns. — Edifices. — Inland Navigation. — Manufactures and Commerce. — Climate and Seasons. — Face of the Country. — Soil and Agriculture. — Rivers. — Mountains. — Forests. — Botany. — Zoology. — Mineralogy. — Mineral Waters. — Natural Curiosities.

THOSE provinces of the Netherlands which were formerly subject to the house of Austria, have been recently annexed to the French dominions. As this fertile territory may probably continue to be united to France, it became necessary to use as much brevity as possible in the description, that it might not, in that case, be disproportionate to the account of that country.

NAMES. The Netherlands in general were anciently known by the name of Belgic Gaul, the chief inhabitants of this part being the Menapii, the Tungri, the Nervii, and the Morini. After the irruption of the Franks, this country formed part of Neustria, or the new kingdom, (the ancient kingdom of the Franks being on the E. of the Rhine,) partly belonging to the province of Flandria, and partly to that of Lotharingia, or Lower Lorrain [1]. In the middle of the ninth century arose the powerful house of the earls of Flanders; and the counts of Hainaut commence about the same epoch. The dukes of lower Lorrain and Brabant are little known till the end of the tenth century. These and other

[1] D'Anville, Etats formés en Europe, 70. &c.

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DUCHY OF JULIERS
DUCHY OF BRABANT
DUCHY OF LUXEMBURG
ZEALAND
HOLLAND
FLANDERS
HAINAULT
CHAMPAGNE
Rhine R.
Meuse R.
Rhine River

great inheritances gradually fell under the power of the dukes of Burgundy, who in the fifteenth century enjoyed dominions worthy of the regal title. With the heiresses of Burgundy the Netherlands passed by marriage to the house of Austria. NAMES.

The length of the Austrian Netherlands, computed from the eastern limit of Luxemburg, to Ostend on the ocean, may be about 180 British miles; and about 120 in breadth, from the northern boundary of Austrian Brabant to the most southern limit of Hainaut. The extent is computed at 7,520 square miles, with a population of 1,900,000. But if the French territory be extended to the Rhine, and thus include large portions of the German circles of Lower Rhine, and Westphalia, the territory and population may be increased by at least one third. Extent.

The original population was Celtic, but was supplanted by the Belgæ, a German colony, afterwards vanquished by the Franks, a kindred nation. The progressive geography may be traced with great certainty from the time of Julius Cesar through the later Roman writers, and the Francic historians of the middle ages. The chief historical epochs are Original Population.

1. The events while the Romans held Gaul. Historical Epochs.

2. Under the Merovingian race of French kings.

3. The ancient earls of Flanders, and Hainaut, and other potentates who shared these territories.

4. The dukes of Burgundy. During these two epochs the Netherlands became the great mart of commerce in the west of Europe, and were distinguished by opulence and the arts.

5. The Austrian domination, accompanied with repeated unsuccessful struggles for freedom. The seven United Provinces having, however, established their liberty, the commerce, and prosperity of the southern regions quickly passed to their northern neighbours.

The remains of Roman art are little memorable, and the chief antiquities consist in grand ecclesiastical and civil monuments of the middle ages, when these regions concentrated a great part of the wealth of Europe, and abounded in excellent artists of all descriptions. Antiquities.

The religion of the Netherlands is the Roman Catholic; and till the French revolution, the inhabitants were noted for bigotry, a great part Religion.

Religion.

of the wealth being in the hands of ecclesiastics. The ancient cultivation of the arts had also a share in this attachment, the Catholic system being naturally endeared by this connexion, while the Reformation has chiefly succeeded in those northern regions where the progress of the arts had not yet captivated the affections of the people. The metropolitan see was the archbishoprick of Mechlin, or Malines. The bishopricks were those of Bruges, Antwerp, Ghent, &c., in number nine or ten.

Government and Laws.

The government and laws had some features of what was formerly deemed freedom; but the decline of commerce having lessened the consequence of the cities and burgesses, this liberty became the monopoly of the nobles, and clergy, who often opposed the will of the sovereign, when exerted in the most beneficial manner for the good of the community. The *Joyeuse entreé* was the magna charta of the Netherlands, a constitutional bond of national privileges. Yet the aristocracy was mild, and the people in general more happy and contented, than they are likely to prove under the tyranny of freedom.

Population.

Revenue.

Political Importance and Relations.

The population being computed at 1,900,000, and the square extent at 7,520 miles, there will be 252 inhabitants to the square mile, while France yields only 174. Under the Austrian power, the revenue of the Netherlands scarcely defrayed the expences of government, and the various extortions of the French rulers cannot afford sufficient data to compute an equitable and lasting revenue. The political importance and relations of these provinces have been long immerged in those of the house of Austria. Their truest interest would have been to have entered into the Dutch confederacy, and thus have established on a broader basis a commercial power, which in strict alliance with England might have defied the encroachments of French ambition: nor must the difference of religion be considered as the chief obstacle to so desirable an event, but rather the narrow policy of the Dutch, who by prohibiting the navigation of the Scheld, and other acts of outrage, excited indelible enmity, where they ought to have secured lasting friendship. But commercial monopoly, which solely considers present gain, is of all others the most unfit spring of government, which ought to regard the advantage of distant posterity. In the present instance it led the Dutch

to

to the an ihilation of their own power and prosperity; while, if the commerce of the southern states had continued uninterrupted, mutual interests might have formed a broad basis of lasting security. Political Importance, &c.

The manners and customs of the Netherlands partake of those of their neighbours, the Dutch and French, the phlegm of the one being tempered by the vivacity of the other. The lower classes were fond of religious pageantry, and much addicted to the superstitious observances of the Catholic system. The Flemish language partakes of the German, and of the Dutch. Manners and Customs. Language.

These provinces boast of early literature, after their conversion to christianity in the seventh century, in various chronicles, and lives of saints; but in modern times they have rarely produced writers of great talents. The native language remains uncultivated, and the chief authors have used the Latin or the French. Froissart was born at Valenciennes, in French Flanders; Philip de Comines at the town so called, about eight miles to the N. of Lisle, and situated in the same division. Lipsius, a man of considerable erudition, was born near Brussels. But in general the Southern Netherlands are more eminent in artists; and the United Provinces in literary characters. Literature.

The education was neglected as in most Catholic countries, where the Jesuits in vain attempted to bring it to a level with that of the Protestant states. The universities, which in no country are of equal importance with the schools, were, however, numerous, considering the extent of the country. Exclusive of Tournay (Dornick) which has been long subject to the French, there were others at Douay, and St. Omer, much frequented by the English Catholics; and one of still greater celebrity at Louvain, founded in 1425. The illustrious professors, commemorated with such applause by Guicciardini, nephew of the great historian, who published an ample description of the Netherlands in the sixteenth century, have been long since forgotten, as to posterity their studies have appeared neither amusing nor useful. Education. Universities.

One of the chief offices of geography, in ancient and modern times, being to give a short descriptive catalogue of the chief cities and towns, in the regions described, these must not be wholly omitted even in this short Cities and Towns.

Cities and Towns.

Bruſſels.

ſhort abſtract. The three chief cities in what were called the Auſtrian Netherlands, are Bruſſels, Ghent, and Antwerp. The capital city of Bruſſels ſtill contains about 80,000 inhabitants, and is beautified by a noble ſquare, one ſide of which is occupied with a vaſt guildhall; by numerous churches, and fountains. The park is alſo a noble ſquare, and in general this city unites the magnificence of Paris with the cleanneſs of a Dutch town. It is ſituated on the ſmall river Sen, or Senne, which runs into the Dyle and the Scheld. It is known as early as the tenth century, and in the fourteenth was ſurrounded with walls. The imperial palace, the wonted reſidence of the governor of the Netherlands, diſplays conſiderable taſte and magnificence.

Ghent.

Ghent contains about 60,000 ſouls, and the circumference of the walls is computed at 15 miles, as it is built on a number of little iſlands formed by four rivers, and many canals, and includes gardens, and even fields. Some of the ſtreets are large and well paved, but only a few churches now deſerve attention.

Antwerp.

The inhabitants of Antwerp are computed at 50,000, the ſad remains of great population and proſperity. This city being placed upon the eſtuary of the Scheld, and formerly the chief mart of Flemiſh commerce, there is a ſtrong citadel, erected by the ſanguinary duke of Alva. The harbour is excellent, but the Dutch fort of Lillo commanded the approach: as to the ſuppoſed impediments they are found to have been fabulous. The ſtreets, houſes, and churches, are worthy of the ancient fame of the city. The exchange is ſaid to have afforded the pattern for that of London. The churches were decorated with many paintings by Rubens, Vandyke, and other Flemiſh maſters: but now preſent only bare walls. In 1568 the trade is ſuppoſed to have been at its greateſt height; and the number of inhabitants was computed at 200,000. It ſtill contains a number of the rich deſcendants of the ancient merchants: with ſome commerce, and a few flouriſhing manufactures, particularly of lace and linen*. Of the other

* See D'Herbouville Statiſtique de Department des Deux Nethes. The Scheld at Antwerp is two thouſand one hundred and ſixty feet in breadth, and thirty feet deep at low water.

principal

principal towns, Mons is computed at 25,000 inhabitants; Bruges, and Namur, each at 20,000; Luxembourg at 12,000; Roermond at 10,000; Limbourg at 8,000. Cities and Towns.

The ſea-coaſt of Flanders, the maritime province, conſiſts chiefly of ſandy hills, and downs, and has few inlets, as moſt of the rivers flow into the Scheld. There are however two ports which deſerve particular notice. The Sluys *, called by the French L'Ecluſe, derives its name from the ſluices, by which the circumjacent country may be laid under water. And a ſimilar circumſtance gives name to Helvöet Sluys, a ſea-port of Holland, ſituated in the iſland of Vorn, about forty miles more to the north. Guicciardini ſays that the haven of Sluys was capable of containing 500 ſhips. The port and population now yield greatly to thoſe of Oſtend. This only other haven on the Flemiſh ſhore has been conſiderably frequented ſince the Scheld was abandoned. The town is ſtill computed to contain 14,000 ſouls, though it ſuffered greatly by the famous ſiege which terminated in 1604, when it was gallantly defended by Sir Francis Vere, at the head of a few Engliſh troops. Many Engliſh families were ſettled here before Oſtend fell a prey to the French. Sea-ports. Oſtend.

In general it may be obſerved that, even at the preſent day, every traveller is impreſſed with ſurprize, not only at the number, but the great extent of the Flemiſh cities, towns, and even villages; in which reſpect the Netherlands exceed every country in Europe, only excepting the United Provinces. The chief edifices are the cathedrals, churches, and monaſteries; though a few caſtles belonging to ancient families, or rich merchants, uſed to attract ſome notice: the taſte of the latter buildings being faithfully copied in the Flemiſh landſcapes, and more remarkable for little prettineſs, peaked roofs, fantaſtic ornaments, the muddy moat, and drawbridge, than for grandeur of deſign, or amenity of ſituation. Edifices.

Idle would be the attempt even to enumerate the canals which interſect theſe provinces in all directions. Some of them date even Inland Navigation.

* Sluys belonged to the United Provinces, but is here mentioned, conſidering the Netherlands to the Rhine at an appendage of France. Nieuport, a little fiſhing town, ſcarcely deſerves notice.

INLAND NAVIGATION.

from the tenth century, and the canal from Bruſſels to the Scheld is of the ſixteenth. Other important canals extend from Ghent, Antwerp, Oſtend, and other cities, and towns, eſpecially in the weſtern diſtricts; but, under the Auſtrian domination, theſe important means of intercourſe were ſhamefully neglected, and it will require much time and labour to reſtore them to their former utility [1].

Manufactures and Commerce.

The manufactures and commerce of the Netherlands, for a long period ſuperior to any in the weſt of Europe, have ſuffered a radical and total decline, owing partly to the other powers entering into competition, and partly to the eſtabliſhment of freedom in the United Provinces, whence Amſterdam aroſe upon the ruins of Antwerp *. What little commerce remains is chiefly inland to Germany, the external employing very few native veſſels. The Eaſt India Company eſtabliſhed at Oſtend was ſuppreſſed by the jealouſy of England, and other powers; and the chief commerce was afterwards carried on by the Engliſh eſtabliſhed in that city. Yet of the manufactures a few fragments remain: Cambray, long ſubject to the French, is ſtill renowned for the cambrics which thence derived their name; as Tour-

[1] Philips, 48.

* The author has been favoured by M. Vernimmen of Antwerp with a M S. memoir on the commerce of this city. In conſequence of the treaty of Munſter in 1648, it had become almoſt null, but began to revive when the Netherlands became a part of France. In the year 1800 ſixty-one veſſels arrived from Emden, Altona, and Hamburg. In 1801 there were one hundred and forty-ſeven from the ſame ports, with ſome Americans. In 1802 there were one hundred and forty-nine; and the commercial connections began to be more extenſive, for ſome were from the Baltic, the Mediterranean, and even from the Weſt Indies; the chief imports being coffee, ſugar, cotton, and cotton cloths, hides, dying woods, tea, indigo, &c. Next year the arrivals were one hundred and eighty-one; ſome from Spain. In 1804 there were one hundred and ſixty-two, among which were many Americans. In 1805, previous to the eighteenth of July, there had arrived no leſs than three hundred and fifty-four, two being from Canton, and one from Batavia; the number of thoſe under the Pruſſian flag was the greateſt, and followed by the Americans. A report had been ſpread that the navigation of the Scheld was impeded, but was found to be fabulous; and a capital chart has recently been publiſhed by the French government, with numerous and exact ſoundings. A canal has been ordered which will join the Rhine, the Meuſe, and the Scheld: new docks are conſtructing, together with a magnificent quay. On the north of the city is a grand dock yard, belonging to Meſſrs. Danet and Company.

When the author paſſed through Antwerp, in July 1805, nine ſhips of the line, from ſeventy-four to one hundred and ten guns, were upon the ſtocks, and expected to be finiſhed in two years; the foreſts of Flanders affording a great and prompt ſupply of timber.

nay,

nay, or Dornick was anciently famous for the fineſt linens. At Bruges there are ſtill ſome manufactures of broad ſays, baize, and other woollens; conſiderable fabrics of broad-cloth, druggets, ſhalloons, and ſtockings, were conducted at St. Omers, chiefly with wool ſmuggled from England. But the chief manufactures are of tapeſtry, fine linen, and laces, at Mechlin, Bruſſels *, Ghent, Antwerp, Louvain, which ſtill enrich the country around, and induce the farmers to cultivate flax, even on the pooreſt ſoils. The Netherlands produce, for home conſumption, abundance of corn, and vegetables; and the coal mines would become important, if the operations were ſkilfully conducted. There is beſides abundance of turf for fuel; with iron, porcelain, clay, and other commodities. MANUFACTURES AND COMMERCE.

The climate of the Netherlands conſiderably reſembles that of the ſouth of England, and is more remarkable for moiſture than for warmth; yet the duchy of Luxembourg produces ſome wine, which probably has the auſterity of the Rheniſh, without its ſpirit. The face of the country is in general level, and the ſemblance of hills can ſcarcely be diſcovered, except towards the Eaſt, where a few elevations relieve the eye from the general flatneſs of the other regions. The ſoil is in general rich ſandy loam, ſometimes interſperſed with fields of clay, but more often with large ſpaces of ſand. Such has been, even in diſtant ages, the ſtate of agriculture that the Netherlands were long eſteemed the very garden of Europe, a praiſe which they ſtill ſhare with Lombardy and England. No ſtronger proof can be adduced of the advantages, which commerce confers on agriculture, than this country, which evinces that the latter advantage chiefly ariſes from commercial opulence employed in its moſt uſeful direction. The mere farmer can never become opulent, except from the pre-exiſtent benefits of trade; but while he is ſharing in the national wealth thus acquired, it is natural that he ſhould impute his ſucceſs ſolely to his own labours. It muſt readily occur that Lombardy, alſo celebrated for its agriculture, was the country of the ancient bankers of Europe, who returned there to enjoy the fortunes which they had acquired; and that England is pre-eminent

Climate and Seaſons.

Face of the Country.

Soil and Agriculture.

* We ſpeak of Bruſſels carpets, but there never was a manufactory of that ſort. Some carpets are made at Tournay.

Soil and Agriculture.

in mercantile wealth: so that the plain facts are worth a thousand theories. Accurate observers repeatedly praise the state of agriculture in the Netherlands, and point out many advantages which it maintained over that of England. The repeated crops of excellent clover, the cole, the turnips, the clean crops of flax, barley, and oats, deservedly attracted their attention. The agriculture has been celebrated for these 600 years, ever since their commerce and manufactures became eminent; and they still possess the essentials of good husbandry in the destruction of weeds, and perpetual crops. They commonly used four horses without a driver, the plowman holding the reins, and being equipped with a long whip stuck into a socket. The plough had wheels, and the furrows were shallow, as they did not wish to turn up the sharp and unmanured sand: on some low spots, between little eminences, was seen abundance of hops, a native and peculiar product adopted in England in the reign of Henry VIII. They never allow the land to lie fallow, regarding the destruction of weeds as the sole advantage of such a practice, which may be equally accomplished by crops of turnips, rape, beans, and clover, which not only destroy the weeds but enrich the soil.

Rivers.

The Netherlands are watered by so many rivers and canals, that it will be sufficient to mention only a few of the chief streams. The Rhine belongs to Germany, passing at a considerable distance to the E. of the frontier; and but a small extent of the Meuse, or Maas, pervades the county of Namur, in these Netherlands. The chief river is the Scheld, which receives two other streams, the Lys, and the Scalpe, the latter near Mortagne, the former near Ghent. All these rivers arise in the county of Artois, from no considerable elevation; and the whole course of the Scheld, or French Escaut, cannot be comparatively estimated at above 120 miles *. The Dyle rises not far to the N. W. of Namur, and joins the Scheld above Niel, after receiving from the E. the Dermer, the Nette, or Nethe from the N. and the Senne from the S. Most of the other rivers yield in importance to the canals, and it would indeed be difficult in many instances to determine whether their course be the work of nature or art. There is no lake worthy of commemoration.

* The Scheld properly rises about eight miles N. of St. Quintin, in the modern department of the Aisne.

Mountains.

Though there be little ridges of hills in the counties of Namur and Luxembourg, the traveller muſt proceed to the diſtant banks of the Rhine before he meets with any elevation that can deſerve the name, even of a ſmall mountain. There are, however, ſeveral woods even in the centre of Flanders; and in Brabant is the foreſt of Soigne. Further to the E. and S. are immenſe foreſts, which almoſt pervade Hainaut and Luxembourg, from Valenciennes to Treves, forming ſtriking remains of the ancient foreſt of Ardennes.

Forests.

Botany.

The vegetable productions of the Catholic Netherlands differ in no reſpect from thoſe of Holland, and all the plants that are natives of this country may be met with in the ſandy and marſhy diſtricts of the South-eaſt coaſt of England, except the Gentiana cruciata. A few ſpecies indeed, which are rare with us, are of frequent occurrence in the Netherlands, particularly the *marſh ragwort*, in ſhallow ditches; *field eryngo*, in great plenty by the ſide of the roads; and the elegant *fringed water-lily*, adorning the canals, and other deep low ſtreams *.

Zoology.

The zoology of the Netherlands affords no remarkable materials. The breed of horſes and cattle is eſteemed for ſize.

Mineralogy.

So plain a country cannot be ſuppoſed to ſupply many minerals: yet coal, perhaps the moſt precious of them all, is found in ſeveral diſtricts, and the ingenuity of the French has been exerted in an improvement of the operations. In the county of Namur are alſo found lead and copper; and Hainaut affords iron, and ſlate. From its iron works Luxembourg derives its chief wealth; and the foreſt of Ardennes is ſtill renowned for the metal of war. Marble, and alabaſter are alſo found in the eaſtern diſtricts. There are no mineral waters of much reputation in the Netherlands; but in the neighbouring circle of Weſtphalia, are thoſe of Aix la Chapelle, and ſtill nearer thoſe of the Spa, about twenty-ſix Britiſh miles S. E. of the former, and diſcovered towards the beginning of the fourteenth century.

Mineral Waters.

Natural Curioſities.

The natural curioſities of ſo flat a country cannot be ſuppoſed to be numerous, nor have travellers indeed indicated any one object of this kind.

* Necker, Deliciæ Gallo-Belgicæ.

RUSSIA IN EUROPE.

CHAPTER I.

Historical Geography.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography, and present Boundaries.—Historical Epochs and Antiquities.

THE Russian empire is, perhaps, the most extensive that ever existed; the length being about 9200 English miles, and the breadth 2400[1]. But the oriental part presents vasts desarts, and a slender population, as will appear in the division of this work appropriated to Asia. The present article must be restricted to an account of Russia in Europe.

By the final partition of Poland, this division now extends from the river Dniester to the Uralian mountains, that grand chain which naturally divides Europe from Asia, a length of about 1600 miles; and in breadth above 1000 English miles. The extent is computed at about 1,200,000 square miles.

Names. Even the European part of the Russian empire embraces many ancient kingdoms and states; but the chief name, that of Russia, shall only be here considered. Amidst the grand conflux of nations towards the west, which attended the decline and fall of the Roman Empire, the Slavonic tribe of Rossi escaped the observation of history till the ninth century; and it is uncertain whether the term were native, or imported

[1] Tooke's View of the Russ. Emp. 3 vols. 8vo. i. p. 6.

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From Arrowsmith's Map of Russia in Europe.

Published March 1st 1802, by Cadell and Davies, Strand, and Longman and Rees, Paternoster Row.

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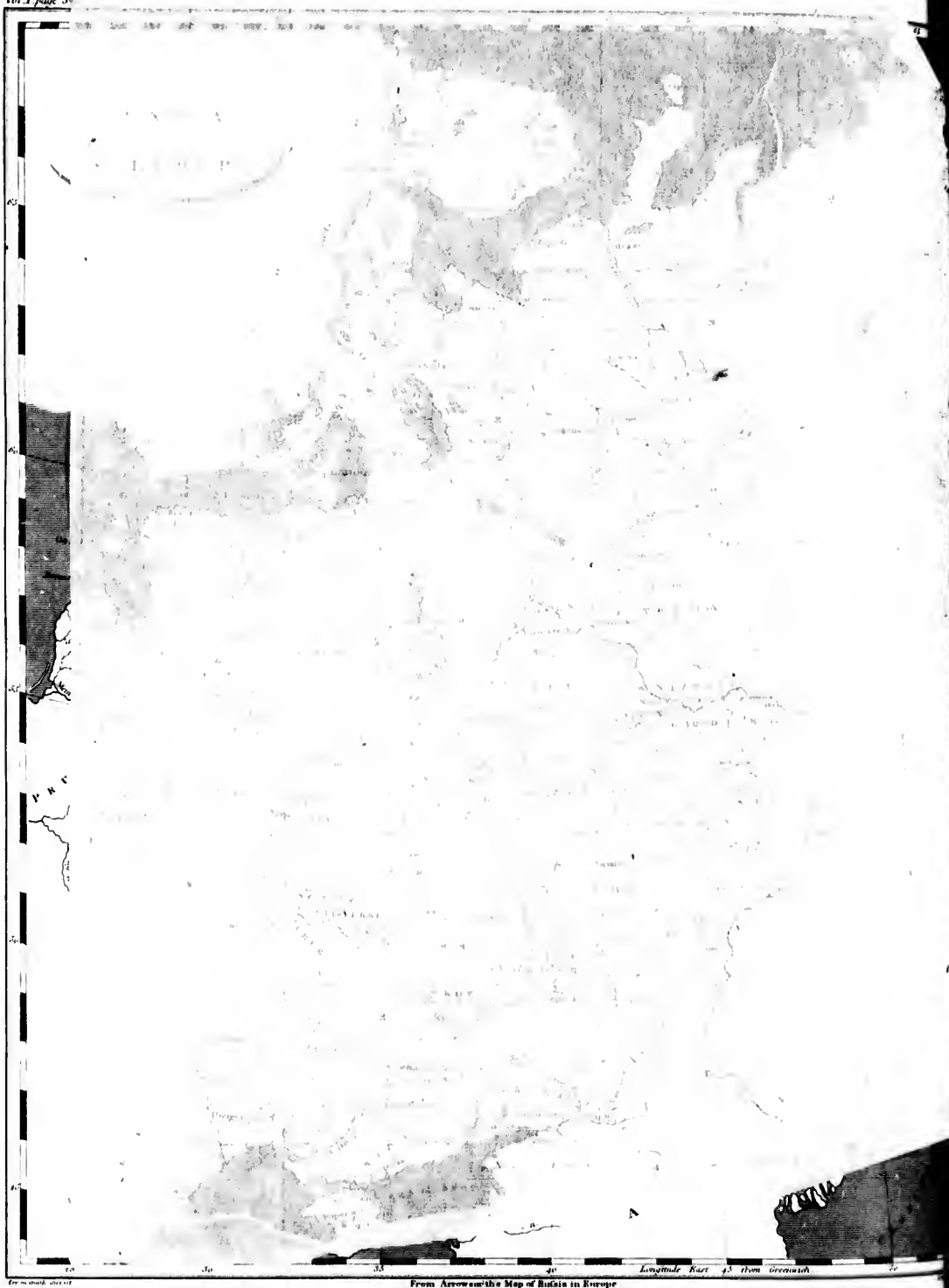
[illegible] population of the European part of the Empire [illegible] [illegible] Slavonic. The Slavonic [illegible] decidedly [illegible] from [illegible] Germany, and [illegible] [illegible]. They are [illegible] of the [illegible] perfect elegance [illegible]

[illegible] into the present [illegible] a history [illegible]. Till the sixteenth [illegible] continued [illegible] the [illegible] of [illegible] Goths [illegible] Even at [illegible] period [illegible] low; and though [illegible] [illegible] Baltic, and the [illegible] towards [illegible] conducted [illegible] and Kiov [illegible] the [illegible] Hanseatic league; the [illegible] cata[illegible] of Julin, at the mouth [illegible] [illegible] in the eleventh century [illegible] between the Slavonic nations and the [illegible] regions of Eu[illegible]



From Arrowsmith's Map of Russia in Europe

Published March 1st 1804, by Cadell and Davies, Strand, and Longman and Rees, Paternoster Row.

by the Scandinavian chiefs who founded the Ruſſian monarchy[2]. In the ſixteenth century, when Ruſſia firſt attracted the obſervation of enlightened Europe, we find that the new appellation of *Muſcovia* had unaccountably paſſed among foreigners from the capital to the kingdom, an impropriety which long maintained its ground, and has not even yet finally expired. It probably aroſe from the name of Ruſſia having been imparted, with the epithets White, Red, &c. to diſtant provinces, one or two of which were ſubject to Poland; whence the vagueneſs of the appellation induced ſtrangers to indicate the kingdom by the metropolis, a practice not unuſual in the obſcurity of the middle ages. NAMES.

The grand population of the European part of the Ruſſian empire is well known to be Slavonic. The Slavons form an extenſive original race of mankind, radically diſtinct from the Goths on the one hand, who, as poſſeſſing the countries more to the weſt, muſt have preceded the Slavons in their paſſage from Aſia into Europe; and equally diſtinguiſhable, in language, perſon, and manners, from the Tatars, and other nations on the eaſt. They are the Sarmatæ of the ancients; and were ever remarkable for perſonal elegance and ſtrength. Original Population.

To enter much into the progreſſive geography of the Ruſſian empire, would be to write a hiſtory of its revolutions. Till the ſixteenth century, this empire continued almoſt unknown to the reſt of Europe, and its geography muſt be faintly traced in the Byzantine annals, particularly in the work of Conſtantine Porphyrogenitus on the adminiſtration of the Empire. Even at that period the Ruſſians held the ſpacious province around Moſcow; and though confined on the eaſt, extended their power to the Baltic, and the vicinity of Pruſſia. Towards the S. the river Boryſthenes conducted them to the Euxine ſea. The capitals were Novagorod and Kiow; the former afterwards famous for its alliance with the Hanſeatic league; the latter ſtill memorable for its catacombs. The city of Julin, at the mouth of the Oder, was alſo remarkable for its trade and opulence in the eleventh century, being the mart of commerce between the Slavonic nations and the weſtern regions of Eu- Progreſſive Geography.

[2] Gibbon, x. 219.

Progressive Geography.

rope; but that capital belonged to the weſtern Slavons and was diſtant from the frontiers of Ruſſia. The victories of the Tatars conſtrained the Ruſſian princes to abandon Kiow about the middle of the twelfth century, and that city having been ruined by the Tatars in the thirteenth, Moſcow became the ſeat of empire. The geography of Ruſſia, in the middle ages, becomes not a little embarraſſed from its repeated ſubdiviſion into ſmall monarchies, which remained in a ſtate of vaſſalage to the Tatars till the year 1462, when Ruſſia emerged from this eclipſe, and gradually acquired its preſent extent and power. Not to detail the ſucceſſive addition of province to province, and kingdom to kingdom, it muſt, however, be remembered that a great founder of the Ruſſian power was Ivan IV, who reigned from the year 1534 to 1584, and ſubdued the Tatar kingdom of Aſtracan, and ſome provinces on the N. W. His ſucceſſor Feodor I, turned his arms towards Siberia, a country which has been however moſt ſlowly inveſtigated, and indeed ſcarcely known till the year 1730. In modern times, Ruſſia has gradually extended her limits at the expence of the Turks; and the addition of an ample third of Poland, has afforded her a ſource ſtill more ſtable and fertile of men and power.

Hiſtorical Epochs.

The following appear to be the chief hiſtorical epochs of this mighty empire.

I. The foundation of the kingdom by Ruric, a Scandinavian chief, A. D. 862. His deſcendants held the ſceptre above 700 years.

II. The naval expeditions of the Ruſſians againſt Conſtantinople, in the tenth century.

III. In the ſame century the baptiſm of Olga the queen, and the ſubſequent converſion of the Ruſſians to Chriſtianity.

IV. The invaſion of the Tatars under Batu Khan in 1236, and the ſubſequent vaſſalage of Ruſſia.

V. The abolition of the power of the Tatars by Ivan III, who died in 1505.

VI. The reign of Ivan IV, ſurnamed Baſilowitz, known to weſtern hiſtorians by the ſtyle of the tyrant John Baſilides.

VII. The death of the Czar Feodor in 1598, with whom expired the long progeny of Ruric. Several impoſtors afterwards appeared, under

under the name of Demetrius, the murdered brother of this sovereign. HISTORICAL EPOCHS.

VIII. The accession of the dynasty of Romanow 1613, in the person of Michael Feodorowitz, sprung in the female line from Ivan IV. He was followed by his son Alexis, father of Peter the Great.

IX. The reign of Peter I has been justly considered as a most important epoch in Russian history; but on reading the annals of the preceding reigns from that of Ivan IV, it will be perceived that a part of our admiration for Peter arises from our inattention to his predecessors; and that the light which he diffused was far from being so sudden and grand as is commonly imagined.

X. The late reign of Catherine II deserves to be commemorated among the most brilliant epochs in the Russian annals; nor must her personal crimes exclude her from the list of great and able sovereigns.

Antiquities. Of ancient monuments Russia cannot be supposed to afford great variety. Sometimes the tombs of their pagan ancestors are discovered, containing weapons and ornaments. We learn from Herodotus that the Scythians regarded the tombs of their princes with singular veneration; and the Sarmatians or Slavons seem to have imbibed the same ideas. The catacombs at Kiow were perhaps formed in the Pagan period, though they be now replete with marks of Christianity. They are labyrinths of considerable extent, dug, as would appear, through a mass of hardened clay, but they do not seem to contain the bodies of the monarchs[3].

The idols of Pagan Russia are sometimes found cast in bronze; and Dr. Guthrie of Petersburg has given an ingenious account of the Slavonic mythology[4]. The chief God, Peroun, was supposed the author of thunder; Volofs resembled Pan; Swetovid was the Sun or Apollo; Silnoy Bog, or the strong god, was Hercules; Leda resembles Mars, &c. Many divinities presided over love, such as Lada or Venus; Lelio or Cupid, and his brother Dido, who, like the Anteros of the Greeks counteracted the power of Cupid. Radagast was the god who protected towns. The Russians had also goddesses corresponding with Ceres, Diana, and Pomona; and their Roussalki were nymphs of the woods and waters.

[3] Herbin. Cryptæ Kijovienses. [4] Dissertations sur les Antiquités de Russie, 1795. 8vo

The

ANTIQUITIES.

The Pagan Ruſſians alſo worſhipped Znitch or Veſta, in the form of fire; and venerated waters, the Bog or Hypanis being as highly regarded as the Ganges among the Indians: the Don and the Danube were alſo holy ſtreams; and there was a ſacred lake, environed with a thick foreſt, in the iſle of Rugen, which was adored by the Slavonic tribes.

The converſion of the Ruſſians muſt of courſe have been followed by the erection of many churches; but as Byzantine or Italian architects were employed, thoſe edifices have but few peculiarities. Perhaps no country of conſiderable extent can afford fewer monuments of ancient art than Ruſſia.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

THE religion of Russia is that of the Greek church, of which, since the fall of the Byzantine empire, this state may be considered as the chief source and power. The creed and ceremonies of the Greek church vary considerably from the Roman, and often in such minute circumstances that a detail would become tedious: the Greeks believe in the procession of the Holy Ghost from the Father alone, while the Roman orthodoxy includes the Son in the mystery. In pomp the Grecian ceremonies do not yield to the Roman catholic; but while the Greeks admit pictures into their churches, they reject images with abhorrence. RELIGION.

The chief patriarch of the Russian church had usurped extraordinary powers, to the great injury of the imperial prerogative; but the spirit of Peter I broke these ignominious bonds, and the patriarchs have since become complaisant instruments of the court. The clergy are very numerous, and have several privileges, particularly exemption from taxes. They have been computed at 67,000, secular and regular. The Greek religion permits the marriage of the secular clergy. The cathedrals and parish churches in the empire are computed at 18,350; the monasteries at 480; nunneries 74: monks supposed to be 7300, nuns 3000. The monasteries have not been such favourite resorts since Peter I and Catherine II opened the sources of industry. The bishoprics amount to about 30. Ecclesiastic Geography.

The government of Russia appears to have been always despotic, there being no legislative power distinct from that of the sovereign. What is called the senate is only the supreme court of judicature. In Government.

GOVERNMENT.

1606 the Czar Basil pretended to a free election by the senate or people; but his coronation was produced by intrigues among the chiefs; and there appears no vestige in Russian history of any national council or parliament, or estates of the empire, far less of a free elective diet, like that of Poland, another Slavonic nation, which a false semblance of liberty led to destruction, while the slavery of Russia produced gradual aggrandizement. Nothing indeed can be more opposite to any theories of government, influence of climate, national character, &c. than the contrast between Russia and Poland. In Russia there is an uniformity of subjection, which at least blends the nation in one united mass, while in Poland the nobles alone were free, and the king and the people alike slaves; but the Polish nobles were strangers to the grand maxim that the slavery or destruction of the nobility must soon follow that of the people. This vast empire is divided into about 40 governments, or vice-royalties, of which 34 may be assigned to the European part. The whole frame of the government may be pronounced to be military; and nobility itself is only virtually estimated by rank in the army.

LAWS.

Immediately on the fall of the Roman empire, we find the Gothic tribes sedulously collecting and publishing their peculiar codes of laws; but it would be difficult to discover any Slavonic code till the sixteenth century; when they emanated, not from the national council, but from the arbitrary will of the monarch. Even in Poland, a country more early civilized than Russia, the first appearance of laws is in a few edicts of Casimir the Great in the fifteenth century; nor is there any semblance of a code more ancient than the middle of the sixteenth. This singular defect may perhaps contribute to account for the fates of the Slavonic nations; and even the pretended Polish liberty of electing the monarch had not existed above three hundred years. The first Russian code dates from the reign of Ivan IV; and the late Empress had the merit of drawing up a new code with her own hands.

POPULATION.

The population of Russia is so diffuse, and spread over so wide an extent of territory, that very opposite opinions have been entertained concerning it. By most writers it was only estimated as equal to that of France, or about 25,000,000: and it was at the same time supposed that the recent acquisitions in Poland might add 5,000,000 to the amount.

But in a late publication,[5] Mr. William Tooke, who has long resided in Russia, and appears to be intimately acquainted with the original documents concerning that empire, has given new elucidations of this important subject, which considerably swell the sum of the inhabitants. He observes that, in order to collect the capitation tax, enumerations of the people have been made at intervals of twenty years since 1723. On the first enumeration, the persons subject to the tax were stated at 5,794,928: this number was always upon the increase; and in 1763 was supposed to yield data for the computation of 20,000,000, as the total population of the empire. But in 1783, more exact estimates were prepared; and in the 41 vice-royalties, then composing the empire, the state of male inhabitants * was as follows: POPULATION.

Merchants - - -	107,408
Burghers - - - -	293,793
Odnodvortzi, and free countrymen - -	773,656
Exempt from taxes - - -	310,830
Crown boors - - - -	4,674,603
Private boors - - - -	6,678,239
	12,838,529

The number of females being supposed to equal that of the males, a population would arise of 25,677,000. The most important accession to the Russian population arises from the partitions of Poland, which with small acquisitions from the Porte have been thus stated:[6]

At the first partition of Poland in 1773 -	1,226,966
From the Porte in the years 1774 and 1783 -	171,610
From the Porte in the year 1791 - -	42,708
At the second partition of Poland 1793 -	3,745,663
By the subjection of Courland - -	387,922
At the third partition of Poland 1795 -	1,407,402
	6,982,271

[5] View of the Russ. Emp. ii. 124.

* Even male babes are included in the capitation tax, under the denomination of their parents.

[6] Tooke i. 327.

POPULATION.

Mr. Tooke afterwards proceeds to give the following account, drawn up as he aſſures us, with the greateſt nicety of examination, and preſenting the whole population of the empire in 1799:

"By the reviſion of 1783 there were in the ſaid 41 governments, computing the female ſex as equal to the male, of regiſtered perſons - - - - - -	25,677,000
The amount of the Kozaks of the Don and the Euxine, according to the moſt authentic private accounts at leaſt - - - - - - - - - - -	220,000
For the unnumbered tribes and claſſes, at the time of the fourth reviſion, we cannot without the higheſt improbability allow leſs than - - - - - - -	1,500,000
Conſequently the Ruſſian empire in the year 1783, might have inhabitants amounting altogether to - -	27,397,000
According to the reſults deduced from experiments and obſervations on the fruitfulneſs and mortality in Ruſſia, this maſs muſt of itſelf have increaſed annually more than half a million. If, in order to keep as far as poſſible from all exaggeration we deduct the half of this ſurplus of births, to allow for the diminution it may have ſuffered by an extraordinary mortality, as by war; there remains by every year an increaſe of 25,000 new citizens, which, excluſively of all aſcending proportion, in 12 years makes a ſum total of - - - - - - - -	3,000,000
The new acquiſitions ſince the year 1783, or the preſent nine vice-royalties of Taurida, Minſk, Bratzlau, Voſneſenſk, Podolia, Volhynia, Courland, Vilna, and Slonim, contain according to a legitimated ſtatement already mentioned - - - - - - - -	5,755,000
Conſequently we may admit, by the moſt moderate eſtimate, the population of the Ruſſian empire at preſent to be - - - - - - - - - - -	36,152,000

Or in a round ſum thirty-ſix millions of perſons."

Of

Of this population Mr. Tooke assigns only about three millions and a half to Siberia, or Asiatic Russia, which contains the five governments of Perm, Ufa, Kolhyvan, Tobolsk, and Irkutsk; but Perm is itself situated on the European side of the Uralian mountains, so that we might perhaps allow even 33,000,000 for the population of European Russia. POPULATION.

Russia being a state new in maritime affairs, cannot boast of any colonies, nor can this name be applied to a small establishment or two in the eastern parts of Siberia. But on the Russian armies a great part of the fate of Europe and Asia must depend, and the subject of course deserves particular attention. Mr. Tooke estimates the whole amount of the Russian troops at 600,000; of which 500,000 may be esteemed effective. But it is supposed that not less than 150,000 are necessary in the garrisons, scattered over this vast and heterogeneous empire, so that if Russia sent forth her whole military force, it would hardly exceed 350,000, of which about 30,000 might be Cozaks. The Russian troops are remarkable for a kind of steady fanaticism, which renders their retreat almost impossible; but they are more accustomed to open and direct combat, than to the grand manœuvres of war. In weight and consistence they somewhat resemble the Spartan phalanx, which was forced to yield to the superior agility and rapidity of the Roman legion. Colonies. Army.

The Russian navy consists of seven detached fleets, employed in the remote seas on which the Empire borders at different extremities. The chief fleet is of course that of the Baltic, which consists of about thirty-six ships of the line. That in the Euxine, or Black sea, at the harbours of Sevastopol, and Kherson, was computed at 12 ships of the line, but not of a high rate, as the Euxine affords no great depth of water; but there are many frigates, gallies, chebecks, and gun-boats. The fleet of gallies in the Baltic, in 1789, was estimated at 110. The Russians are rather averse to a sea-faring life; and there is scarcely any prospect of this Empire ever becoming a great maritime power. Navy.

The revenues of Russia are supposed to amount to about 50,000,000 of rubles; which, valuing the ruble at four shillings, will be equal to 10,000,000l. sterling. The national debt is supposed to amount to little or nothing. Revenues.

With

POLITICAL IMPORTANCE, &c.

With all these advantages it is no wonder that the political importance, and relations of Russia are so preponderant in Europe, and Asia. In Europe her recent acquisitions have contributed to render her more and more formidable. It is fortunate that the powerful dominions, of Prussia, and Austria, are interposed between Russia and the German Empire, else the liberties of Europe would be endangered, and perhaps totally crushed, by a new flood of barbarians issuing from the same sources with those which formerly deluged the civilized world. If the Russian empire be not divided, there is room to predict that another Macedon will subdue another Greece. Poland has been devoured; Denmark and Sweden may be considered as subject-allies; and if the whole force of Russia were bent against either Austria or Prussia, it is hardly to be conceived that the shock could be withstood. It would certainly be for the interest of Europe that the Russian force should be diverted towards Asia, that by extending her dominions in that quarter her strength may be still more dispersed, when probably a division of the empire would commence, to the lasting advantage of the other continental powers. As the Greek religion prevails among the Christians of Greece, and Asia, Russia would in them find more faithful subjects, than among the catholics and protestants of Europe.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs.—Language.—Literature.—Education.—Universities—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

AS the Russian empire comprizes so many distinct races of men, the manners of course must be very various. But in the European division, to which this brief account is restricted, the grand distinctions are, a few Laplanders on the east of the mountains of Olonetz, which divide Russia from Sweden; the Samoieds beyond the river Mezen; the Fins of the White sea, and the Baltic, with some remains of the same people towards the Uralian mountains; the grand Slavonic mass in the centre, including the Cozaks of the South who are also Slavons; and a few Tatars in Taurida, a beautiful region, which forms the south-east extremity of Europe. The Laplanders are well known to be a diminutive race, who would be amiable from the pastoral simplicity of their manners, were not their persons ugly, and disfigured with physical impurity. The Fins are also rather short in stature, with flat faces, deep cheeks, dark grey eyes, a thin beard, tawney hair, and a sallow complexion; but the southern Fins, though they retain the national features, are of superior appearance. There is a small district in the northern extremity of Scandinavia, idly called Finmark; but the chief region of the Fins is around the gulph of Finland, and thence on the south of the White sea, where was in ancient times the celebrated region of Permia, by the Scandinavian writers called Biarmia, which some suppose extended from the White sea to the mountains of Ural. Permia is mentioned in the account drawn up by Ohter for the use of Alfred the Great: and a fabulous detail is given of its wealth, particularly the rich temple

MANNERS AND CUSTOMS.

temple of Yummala, the chief god of the Fins, decorated with a profusion of gold and jewels. Mr. Tooke[1] assures us that the ruins of ancient towns remain to evidence the civilization and prosperity of this people; and he supposes that the Permians traded with Persia, and India, by the Caspian sea, the rivers Volga and Kama, and that the mart was Tscherdyn, an old commercial town on the river Kolva. The repeated incursions of the Scandinavian pirates drove the Fins further to the south; and modern Perm is about 700 miles from the sea. The Fins used to excel in fishing and the chace; but they are now much blended with the Slavons, and have generally adopted their manners and customs.

The manners of the Slavonic Russians, who constitute the chief mass and soul of this empire, have been well described by Dr. Guthrie, and Mr. Tooke. They are generally middle-sized and vigorous: the tallness, and grace of the Polish Slavons seem to arise from superior climate, and soil. The general physiognomy consists of a small mouth, thin lips, white teeth, small eyes, a low forehead, the nose commonly small, and turned upwards, beard very bushy, hair generally reddish.[2] The expression of the countenance is gravity, with good nature, or sagacity; the gait and gestures lively and impassioned. The women destroy their naturally fine complexion with paint, and their personal charms expire at an early age. The Russian is extremely patient of hunger and thirst; and his cure for all diseases is the warm bath, or rather vapour bath, in which the heat is above 32° of Reaumur, which contributes greatly to health, and is supposed to be the only cause why that shocking disease, the Plica Polonica, has never appeared in Russia. Dr. Guthrie has shewn that the Russians retain many manners and customs derived from their Pagan ancestors, and has given some curious specimens of their songs and music, which seem to be very pleasing. He has also compared their dances with those of the Greeks; and finds in one of them a considerable resemblance of the wanton Ionic, while another resembles the Pyrrhic. He observes that the country girls dress in the *saraphan*, resembling the ancient *stola*, and bind up their hair with the *lenta* a ribbon like the ancient *vitta*. They tinge their

[1] Tooke, i. 528. [2] Tooke, ii. 253.

 cheeks

cheeks with the juice of the *echium Italicum*. When a marriage is proposed, the lover, accompanied by a friend, goes to the house of the bride, and says to her mother, "shew us your merchandise; we have got money;" an expression which is thought to refer to the ancient custom of buying a wife. The other ceremonies are equally curious, but cannot be detailed in this abstract. The Russians shew great attention to their nurses, and are so hospitable that they offer to every stranger the *Khleb da sol*, or bread and salt, the symbol of food, lodging, and protection. At a repast, some salt fish, or ham, and a glass of brandy, are presented in the first place; and after dinner cakes made with honey are usually served; the common drink is kvass, an acid, thin, malt liquor: the houses are ornamented with stoves, and, among the rich, by flues conducted into every room, which is at the same time guarded with double windows. Fires are also employed with profusion to obviate the severity of winter in the northern provinces; but at Petersburg the air is so pure that there is no occasion to paint the iron chains in the streets, as they are not attacked by rust. In several instances the Russians form a curious junction of European, and Asiatic manners; many of their ceremonies partake of Asiatic splendour: the great are fond of dwarfs; and some opulent ladies maintain female tellers of tales, whose occupation is to lull their mistresses asleep, by stories resembling those of the Arabian nights.* Manners and Customs.

The Russian language is extremely difficult to pronounce, and not less difficult to acquire, as it abounds with extraordinary sounds, and anomalies of every kind. The characters amount to no less than thirty-six; and the common sounds are sometimes expressed in the Greek character, sometimes in characters quite unlike those of any other language. The tones peculiar to the Russian are often expressed by letters, which wear a very ill chosen semblance to the Greek or Roman. In some respects the sounds seem to approach the Persian and Arabic; a circumstance which can hardly arise from the Mahometan domination of the Tatars, as after Nestor, who wrote his annals about the year 1000, there is a succession of Russian authors. Among other singularities Language.

* For an account of the Samoieds, who first appear about 300 miles E. of Archangel, the reader is referred to the Hist. Gen. des Voy. Tome xviii. Fr. edit. or xxiv. ed. Holl. 4to.

 there

Language. there is one letter to expreſs the *ſch*, and another the *ſſch*, the latter a ſound hardly pronounceable by any human mouth.

Literature. The Ruſſian literature ſucceeded, as uſual, the converſion of the Empire to Chriſtianity. As there is no inducement for ſtrangers to learn the language, for the purpoſe of peruſing works of genius, it is unneceſſary to enlarge upon it in a work of this general nature. The elder authors are either writers of annals, or compilers of martyrologies, and lives of ſaints. Neſtor, the eldeſt hiſtorian, alſo ſet an example of the latter kind. In recent times the beſt authors reſident in Ruſſia, ſuch as Pallas, and many others, have had recourſe to the German language: and little can be expected from the native literature, till the language ſhall have been reduced to the more preciſe alphabet, and poliſhed form of other European dialects.

Education. Education is little known or diffuſed in Ruſſia, though the court have inſtituted academies for the inſtruction of officers and artiſts. The Univerſities. univerſity of Peterſburg, founded by the late Empreſs Catharine II. is a noble inſtance of munificence, and it is hoped will eſcape the fate of the colleges, founded at Moſcow by Peter the Great, which do not ſeem to have met with the deſerved ſucceſs.

Cities and Towns. Moſcow. In conſidering the chief cities and towns of Ruſſia, Moſcow the ancient capital attracts the firſt attention. This city dates from the year 1300, and is of very conſiderable extent, and population, though injured by a peſtilence in 1771. Prior to this mortality the houſes in Moſcow were computed at 12,538, and the population at not leſs than 200,000.* Moſcow is built in the Aſiatic manner, in which cities Peterſburg. cover a vaſt ſpace of ground. Peterſburg, the imperial reſidence, is ſaid to contain 170,000 inhabitants; and is the well-known, but ſurpriſing erection of the laſt century. This city has been ſo repeatedly deſcribed that the theme is trivial. Suffice it to obſerve that it ſtands in a marſhy ſituation on the river Neva, the houſes being chiefly of wood, though there be ſome of brick ornamented with white ſtucco. The ſtone buildings are few; and Peterſburg is more diſtinguiſhed by its fame, than by its appearance or opulence. The nobleſt public works are the quays, built of perpetual granite, while we employ periſhable freeſtone.

* Coxe, Tr. in Poland, i. 351. 8vo. eſtimates, from good evidence, the population at 250,000.

Cronſtadt

Cronſtadt in the government of Peterſburg, and Kollonna in that of Moſcow, are ſuppoſed each to contain about 60,000 inhabitants. Cherſon in the government of Ecatharinſlav, and Caffa in Taurida, are ſaid each to contain 20,000; while 30,000 are aſcribed to Tula, and 27,000 to Riga, a city of conſiderable trade and conſequence. In general the Ruſſian towns are built of wood, and preſent few remarkable edifices. A cathedral or two, and the royal palaces and fortreſſes, may deſerve a deſcription, better adapted to a book of travels, than to a work of this nature. Cities and Towns. Edifices.

The inland navigations of Ruſſia deſerve more attention. Among other laudable improvements, Peter the Great formed the deſign of eſtabliſhing an intercourſe by water between Peterſburgh and Perſia, by the Caſpian ſea, the Volga, the Meſta, and the lake of Novgorod, &c. but this ſcheme failed by the ignorance of the engineers, and the emperor afterwards employed Captain Perry, who rather taught the proper manner than completed any great work. During the long reign of the late empreſs many canals were accompliſhed, or at leaſt received ſuch improvements that the chief honour muſt be aſcribed to her adminiſtration. The celebrated canal of Viſhnei Voloſhok was in ſome ſhape completed by Peter, ſo as to form a communication between Aſtracan and Peterſburg, the courſe being chiefly afforded by rivers, and it was only neceſſary to unite the Twertza running towards the Caſpian, with the Shlina, which communicates with the Baltic. The navigation is performed according to the ſeaſon of the year, from a fortnight to a month; and it is ſuppoſed that near 4000 veſſels paſs annually.[1] Inland Navigation. Viſhnei Voloſhok.

The canal of Ladoga, ſo called, not becauſe it enters that lake, but as winding along its margin, extends from the river Volkof to the Neva, a ſpace of 67½ miles, and communicates with the former canal. By theſe two important canals conſtant intercourſe is maintained between the northern and ſouthern extremities of the empire. Another canal leads from Moſcow to the river Don, forming a communication with the Euxine; and the canal of Cronſtadt forms a fourth. Peter the Great alſo deſigned to have united the Don with the Volga, and thus have opened an intercourſe between the Caſpian, and Euxine ſeas and the Ladoga.

[1] Phillips, 20, 29.

INLAND NAVIGATION.

Baltic: and the whole empire abounds so much with rivers that many advantageous canals remain to be opened. Some progress was made in a canal from the river Volkof towards the White sea, which would considerably improve the commerce of Archangel.

Manufactures and Commerce.

By these means the inland trade of Russia has attained[1] considerable prosperity; and the value of her exports and imports have been long upon the increase. Several manufactures are conducted with considerable spirit.[2] That of isinglass, which is a preparation of the sounds, or air bladder of the sturgeon, flourishes on the Volga, the chief seat also of that of kaviar, consisting of the salted roes of large fish. The manufactories of oil and soap are also considerable; and Petersburg exports great quantities of candles, besides tallow, which abounds in an empire so well replenished with pasturage: nor must the breweries and distilleries be forgotten. Saltpetre is an imperial traffic, and some sugar is refined at Petersburg. There are several manufactures of paper, and of tobacco, which grows abundantly in the southern provinces. Linen is manufactured in abundance, the best comes from the government of Archangel. Cotton is little wrought, but the silk manufactories are numerous: coarse cloths, carpets, and hats are also made in Russia, and leather has long been a staple commodity. The mode of making Russian leather is described with great minuteness by Mr. Tooke.[3] Shagreen is made of chosen portions of the hides of the horse and ass, impressed with the hard seeds of certain plants, which are trodden in to mark the leather. Russia produces vast quantities of wax, which is however generally exported unbleached; nor are there wanting fabrics of earthen ware and porcelain. Iron founderies abound; and in the northern government of Olonetz is a grand foundery of cannon.

The commerce of Russia was known in the middle ages, by the connection between the Hanse towns, in the north of Germany, and Novgorod, established about 1276. So wide is now this empire that it maintains a commerce of the most remote descriptions, on the Baltic, and the White sea, the Euxine and the Caspian, with Persia, and with China. The English having, so to speak, discovered Russia in the

[1] Tooke, iii. 463, &c. [2] Vol. iii. p. 513, &c.

sixteenth

fixteenth century, the Czar Ivan Basilowitz, delighted with this new intercourse, caused a harbour to be constructed on the White sea, where the English arrived, which was called the harbour of the Archangel Michael, and afterwards, for brevity, Archangel. This commerce continued till Petersburg was founded: yet Archangel still affords a moderate trade, and exports pot ashes, kaviar, tallow, wax, hides, hemp, &c. with corn, linseed, coarse linens, and other articles. The commerce of Petersburg is much of the same description: that of Riga is very considerable, and to other articles are added masts from the Dnieper. Riga was the capital of Livonia, a province which formerly occasioned many disputes between Russia, Sweden, and Poland; but in 1710 was finally subdued by Peter the Great. In general the exports of Russia, by the Baltic, exceed the imports by one third part. The imports of Petersburg in 1797 were computed at about 20,000,000 of rubles, or about 4,000,000l. sterling. Russia is supposed to export grain annually to the value of 170,000l. and hemp, and flax, raw, and manufactured, to the amount of a million and a half sterling. MANUFACTURES, &c.

The commerce of the Euxine, or Black sea, is of inferior moment, chief exports, furs, salt beef, butter, cordage, sail cloth, kaviar, corn; with iron, linen, and some cotton stuffs. Imports, wine, fruit, coffee, silks, rice, and several Turkish commodities.[1] The commerce of the Caspian was known to the Genoese, who, by permission of the Byzantine emperors, had formed a settlement in Crim. The chief Russian harbours are Astracan, the chief seat of the Caspian commerce, Gurief, and Kisliar. Persian havens are Derbent, Nisabad, and Baku; with Medthetizar, and Farabat on the southern shore of the Caspian. Astrabat opens the trade with Kandahar. From Astracan are exported many European manufactures; and the chief imports are raw silk, rice, dried fruits, spices, saffron, sulphur, and naphtha. The Hindoo merchants occasionally bring gold, and precious stones. The annual trade is computed at 1,000,000 of rubles, or 200,000l. That of the Euxine is not above one third of this value.

Russia likewise maintains some commerce by land with Prussia. That with Persia is of little moment; chief imports silk. There is a

[1] Tocke, iii. 572.

MANUFACTURES, &c.

considerable trade by land with the Kirgufes, who fend horfes, cattle, and fheep, in return for woollen cloths, iron, and European articles. That with China is nearly on a par; each country tranfmitting to the amount of about 2,000,000 of rubles (400,000l.). Ruffia exchanges her precious Siberian furs for tea, filk, and nankeen.

The internal commerce of Ruffia is very confiderable; and Siberia is faid to afford in gold, filver, copper, iron, falt, gems, &c. to the amount of 12,000,000 of rubles (2,400,000l.), that between the fouthern and northern provinces is alfo of great extent and value. The coin current in the empire is fuppofed to amount to about 30,000,000l. fterling, the paper money to about 20,000,000l. The Siberian gold, and filver fupply an important addition to the national currency.

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CHAPTER. IV.

NATURAL GEOGRAPHY.

Climate and Seaſons. — Face of the Country. — Soil and Agriculture. — Rivers. — Lakes. — Mountains. — Foreſts. — Botany. — Zoology. — Mineralogy. — Mineral Waters. — Natural Curioſities.

CLIMATE AND SEASONS.

THE climate of Ruſſia in Europe, as may be expected in ſuch a diverſity of latitudes, preſents almoſt every variety from that of Lapland, to that of Italy: for the newly acquired province of Taurida may be compared with Italy in climate and ſoil. But winter maintains the chief ſway at Peterſburg, the capital, and the Neva is annually frozen from November to March, or April. Euler has even obſerved that at Peterſburg only two months in the year may be expected to be free from ſnow: and the climate around the frozen ocean, and the laſt European iſle upon the N. E. that of Novaya Zemlia, or the New Land, is of noted ſeverity, the northern ſide being encompaſſed with mountains of ice, and the ſun not viſible from the middle of October, till February; while it never ſets during June and July. Taurida preſents, on the contrary, all the luxuriance of the ſouthern year, while the middle regions are bleſt with the mild ſeaſons of Germany and England.

Face of the Country.

In ſo wide an empire the face of the country muſt alſo be extremely various; but the chief feature of European Ruſſia conſiſts in plains of a prodigious extent, rivalling in that reſpect the vaſt deſarts of Aſia and Africa. In the ſouth are ſome extenſive *Steppes*, or dry and elevated plains, ſuch as that above the ſea of Azof, in length about 400 Engliſh miles. The numerous and majeſtic rivers alſo conſtitute a diſtinguiſhing feature of this empire.

Soil and Agriculture.

The ſoil is of courſe alſo extremely diverſe, from the chilling marſhes which border the White and Frozen ſeas, to the rich and fertile plains

SOIL AND AGRICULTURE.

on the Volga. The moſt fertile is that between the Don and the Volga, from Voronetz to Simbirſk, conſiſting of a black mould, ſtrongly impregnated with ſaltpetre; that is a ſoil formed from ſucceſſive layers of vegetable remains.' The great extent of arable land might be much encreaſed if induſtry were more diffuſed. In Livonia, and Eſthonia the medial returns of harveſt are eight or ten fold; and the latter is generally the produce of the rich plains near the Don, where the fields are never manured, but on the contrary are apt to ſwell the corn into too much luxuriance. Paſturage is ſo abundant that the meadows are little regarded, and the artificial production of graſſes is ſcarcely known. Some of the meadows are watered, and produce large crops of hay, the dry paſtures (ſometimes opened for grain) yield a ſhort, but nutritious produce; in a few of the ſteppes the graſs will attain the height of a man, and is ſeldom mown. In the ſylvan age the annual burning of this graſs, as practiſed by ſavages, may have produced the rich black mould ſo abundant in ſome large regions of the empire.

Agriculture is hardly known in the northern parts of the governments of Olonetz, and Archangel; but in the central parts of the empire has been purſued from time immemorial. The Ruſſian plough is light and ſimple, and ſcarcely pierces the ground to the depth of two inches; but in the ſouthern provinces a heavier kind is uſed, reſembling the German. In what is called the ſummer field the corn is ſown and reaped in the ſame year; while in the winter field the corn is ſown in autumn, and the produce reaped in the enſuing ſummer. The former yields what is called ſummer wheat, and rye, barley, millet, buck-wheat, flax, hemp, peaſe, &c. the latter only wheat, or rye: and the winter field is commonly left fallow till the following ſpring. In general agriculture is treated with great negligence, yet the harveſts are abundant: even in the neighbourhood of Peterſburg there are large marſhes which might be eaſily drained, and converted into fertile land. In the north rye is moſt generally cultivated; but in the middle and the ſouthern regions wheat: in the government of Ekatarinoſlaf the Arnautan wheat is beautiful, the flour yellowiſh, the return commonly

[1] Tooke, i. 67.

fifteen

Soil and Agriculture.

fifteen fold; nor is Turkiſh wheat, or maiz unknown in Taurida. Barley is a general produce, and is converted into meal, as well as oats, of which a kind of porridge is compoſed. Millet is alſo widely diffuſed; but ſpelt, or bigg, little cultivated. Rice ſucceeds well in the vicinity of Kiſlear. Potatoes are unaccountably neglected, except in the north. This invaluable root bears the cold of Archangel, and yields from thirty to fifty fold. Hemp and flax form great objects of agriculture. Madder, woad, and ſaffron grow wild in the ſouth. The hop is alſo cultivated, and is found wild near the Uralian chain, and in Taurida. Tobacco has been produced ſince the year 1763, chiefly from Turkiſh and Perſian ſeed. The olive has been tried in vain at Aſtracan; but proſpers in the ſouthern mountains of Taurida along the Euxine. In the gardens are cultivated cabbages, of which a great number is conſumed in the form of ſour-kraut, and other plants common in Europe. The government of Moſcow produces abundance of excellent aſparagus; and ſugar-melons abound near the Don, and the Volga. Large orchards are ſeen in the middle and ſouthern parts of Ruſſia, yet quantities of fruit are imported. While apples, and pears are found as far north as the 49°, plumbs and cherries extend to the 55°. What is called the Kireſſkoi apple often weighs four pounds, is of an agreeable flavour, and will keep a long time. A tranſparent ſort from China is alſo cultivated, called the Nalivui, melting and full of juice.[a] The culture of the vine has been attempted in the ſouth, and will certainly, with proper management, ſucceed in Taurida. Bees are not known in Siberia, but form an object of attention in the Uralian foreſts, where the proprietors carve their hives to a conſiderable height in large trees, and they are ſecured from the bears by ingenious contrivances deſcribed by Mr. Tooke. Mulberry trees and ſilk are not unknown in the ſouth of European Ruſſia.

Rivers. Volga.

In enumerating the chief rivers of European Ruſſia the firſt attention is due to the majeſtic Volga, which forms, through a long ſpace, the boundary between Aſia and Europe, belonging properly to the latter continent, in which it ariſes, and from which it derives its ſupplies, till

[a] Tooke, iii. 310.

Rivers. at Tzaritzin, about 250 miles from its mouth, it turn S E. into Asia. This sovereign of European rivers derives its sources from several lakes in the mountains of Valday, and government of Twer, between Petersburg and Moscow; and bends its chief course to the S. E. till, near its junction with the Kama, an important river fed by many streams from the Uralian chain, it turn towards the S. W. till it arrive at Tzaritzin. Its comparative course may be computed at about 1700 miles. This noble river, having no cataracts, and few shoals, is navigable even to Twer: but it is said that the stream has become more shallow even since the commencement of last century. The tributary rivers of the Volga are chiefly from the east, the Kama, which rivals the Volga at their junction, rising in the government of Viatka, and running N. W., afterwards due E., and then S. On the west the chief stream which runs into the Volga is the Oka, which rises in the government of Orel.

Don. Next to the Volga, on the west, is the Don, or Tanais, which rises from a lake in the government of Tulan, and falls into the sea of Azof, after a course of about 800 miles.

Neiper. The Neiper, or ancient Borysthenes, rises in the government of Smolensk, about 150 miles to the south of the source of the Volga, and about 100 to the S. E. of that of the Duna, or Duina, which flows into the Baltic, by Riga; and after a course of about 1000 miles, through rich and fertile provinces, falls into the Euxine. The Bog, or Hypanis, a far inferior stream, falls into the Liman, or estuary of the Neiper.

Niester. The Niester, or ancient Tyras, now forms the boundary between European Turkey and Russia, deriving its source from the north side of the Carpathian mountains, and falling into the Euxine at Akerman, after a course of about 600 miles.

Several important rivers direct their course towards the Arctic Ocean, such as the Cara, which though not a considerable river is yet remarkable, as forming the boundary between Asia and Europe, for the space of about 140 miles, the Uralian chain terminating so far from the sea of Cara-skoi, or Karskoi.

The

The river Petſhora riſes in the Ural mountains, and joins the Frozen Ocean, after a courſe of about 450 miles. Rivers. Petſhora.

Next, on the weſt, is the Mezen, which falls into the White Sea after a courſe of about 350 miles.

The Dwina falls into the gulph of Archangel, after a conſiderable courſe of about 500 miles. The Onega cloſes the liſt of the chief rivers that flow into the Arctic Ocean; for thoſe of Olonetz, and of Ruſſian Lapland, are of little conſequence. Dwina.

The Svir joins the lake of Onega with that of Ladoga, which by the Neva, a more important ſtream, falls into the gulph of Finland. This river, pervading the city of Peterſburg, is about forty miles in length, but of conſiderable breadth and depth, and ſubject to violent floods, which have been recently guarded againſt by deepening the bed, and by erecting ſtrong quays of granite. Neva.

The Narva alſo runs a ſhort courſe from the Tchudſkoi, or Peypus lake, into the Finniſh gulph. The Pernof riſes ſome miles to the weſt of the Peypus lake, and falls into the gulph of Riga.

But the moſt conſiderable ſtream in this quarter is the Duna, whoſe ſource has been already mentioned. It has ſome conſiderable and dangerous falls; and ſometimes greatly injures the city of Riga, at the breaking up of the ice. Its courſe is about 500 miles. The Nimen now forms a part of the boundary between Ruſſia and Pruſſia, and is joined by a canal to the river Pripaz, which falls into the Neiper; but the cataracts in the latter river, about 250 miles above its eſtuary, greatly impede the intercourſe that might thus be eſtabliſhed with the Euxine. Duna. Nimen.

The chief lakes of European Ruſſia are ſituated in the N. W. diviſion of the empire. There is a conſiderable lake in Ruſſian Lapland, that of Imandra; to the ſouth of which the government of Olonetz preſents many extenſive pieces of water, particularly the large lake of Onega, which is about 150 miles in length, by a medial breadth of about 30. The iſlands and ſhores of the Onega are chiefly calcareous, and contain ſome valuable marbles. To the weſt is the Ladoga, about 130 miles in length, by 70 in breadth, being one of the largeſt lakes in Europe. As it has many ſhoals, and is liable to ſudden and violent tempeſts, Lakes. Onega.

Lakes. Peter the Great opened a canal along its ſhore, from the Volkof to the Neva. The fiſhery of this lake ſeems of little conſequence; but the northern ſhores produce the beautiful Finniſh marble, which is much uſed at Peterſburg.

Peypus. On the S. W. we find the lake of Peypus, about 60 miles in length by 30 in breadth: the northern part of this lake is ſtyled that of Tſhud, the ſouth that of Pſcove. From the Peypus iſſues the river Narova, or Narva, and there is an iſland, with three villages, called Bolka. Fiſh abound, particularly a kind which reſembles the herring; barbel, pike, perch, carp, and others. To the eaſt is the the lake Ilmen, on which ſtands the ancient city of Novogorod. The Bielo, or White lake, is ſo called from its bottom of white clay. The lake of Coubenſkoi, and a few others to the N. E. are of inferior note.

But the lakes that give riſe to the famous Volga muſt not be omitted. The chief of theſe is the lake Seliger, in the government of Twer, which, though narrow, extends about 30 miles in length; and a ſmaller lake, not far to the weſt, emits another ſource of that auguſt river.

Mountains. It has already been mentioned that European Ruſſia is rather a plain country, though ſome parts of it be greatly elevated, ſuch as that which ſends forth the three rivers of Duna, Volga, and Nieper. This region, which is paſſed in travelling from Peterſburgh to Moſcow, is by ſome called the mountains of Valday, from the town and lake of Valday, ſituated on the ridge; but by the natives it is ſtyled *Vbiſokaya Ploſtchade*, or elevated ground; and no mountains are here delineated in the common maps. In this quarter the ground is ſtrewn with maſſes of granite, but the hills are chiefly marl, ſand, and clay; and what are called the mountains of Valday ſeem to be a high table land, ſurmounted with large ſand hills, and interſperſed with maſſes of red and grey granite, with hornblende, ſhorl, and ſteatites: near Valday is the higheſt part of the ridge, which ſeems to be in a N. E., and S. W. direction. The hills, lakes, and groves are beautiful; and there is an iſland with a noble monaſtery. To the ſouth of Valday the maſſes of granite become ſmaller, and more rare; and calcareous petrifactions appear, which are followed by the clay near Moſcow. Some ſuppoſe the

Valday.

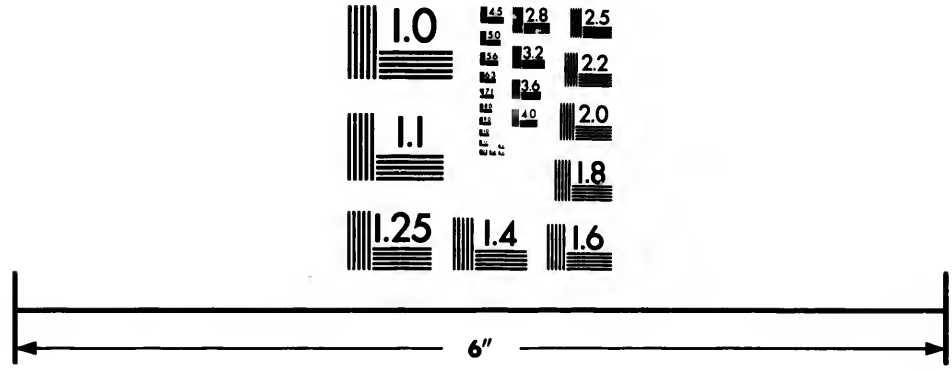
the uplands of Valday to be an extenſion of the mountains of Olonetz, passing between the lakes Onega and Ladoga, and afterwards between those of Ilmen and Seliger; where is the chief ridge, and which seems to present the ruins of what was once a granitic chain. Mr. Tooke[1] computes the higheſt point of the Valday at only 200 fathoms above the level of Peterſburg, about 1200 feet above the sea: the height is inconſiderable, and gives a ſtriking impreſſion of the gentle and plain level, through which ſuch extenſive rivers muſt purſue their courſe. The woods on the Valday are chiefly pine, fir, birch, linden, aſpen, and alder: ſoil in the vales fertile, moſtly clay and marl. MOUNTAINS.

From the Valday towards the S. ſcarce a mountain occurs; but after paſſing the ſteppe of the Nieper, an arid plain with ſalt lakes, which indicate the extent of the Euxine at remote periods, we arrive at the mountains of Taurida, which are rather romantic than of remarkable height, being calcareous and alluvial. To the S. of this chain, along the ſhores of the Euxine, are the beautiful vales, ſo well deſcribed by Pallas, productive of the laurel, the olive, the fig, and the pomegranate, while the Arbutus adorns the ſteepeſt cliffs with its red bark, and foliage of perpetual green. The caper and the vine alſo abound in this natural orchard: and the flocks of ſheep and goats feeding on the hills, or bounding from the rocks, unite with the ſimple and good humoured manners of the Tatar inhabitants, to render the ſcene truly paſtoral. Taurida

But the moſt important chains of mountains in European Ruſſia remain to be deſcribed, those of Olonetz in the furtheſt N., and those of Ural which ſeparate Europe from Aſia. The chain of Olonetz runs in a direction almoſt due N., for the ſpace of 15° or about 900 G. miles. The moſt arctic part is ſaid to conſiſt chiefly of granite, gneiſs, petroſilex, and ſchiſtoſe limeſtone; and is not of great height, but retains perpetual ſnow from the altitude of the climate. More to the S., branches ſtretch on the E. towards the gulph of Kandalak; the granite is intermixed with large ſheets of talc, and patches of trap are found, particularly near the gold mines of Voytz, on the weſtern ſide of the river Vyg. Various other ores occur in this region, and veins of cop- Olonetz.

[1] Vol. i. 130.

IMAGE EVALUATION
TEST TARGET (MT-3)



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Mountains.

per pyrites appear in the trap. Towards the lakes of Onega and Ladoga, the calcareous rather preponderates, as already mentioned.

In the centre, between the mountains of Olonetz and those of Ural, there seems to be a considerable chain extending from the E. of Mezen to the Canin Nos, a bold promontory which rushes into the frozen ocean; but this chain appears to have escaped the searches of curiosity or avarice, by the perpetual snows with which it is enveloped. The immense Uralian chain extends from about the 50th to near the 67th degree of N. latitude, or about 1000 G. miles in length, and has by the Russians been called *Semenci Poias*, or the girdle of the world,* an extravagant appellation, when we consider that the chain of the Andes extends near 5000 miles. Some modern authors have imagined that this chain is the same with the Riphæan mountains of antiquity; which, on the contrary, as appears from Ptolemy and others, ran from E. to W. near the head of the Tanais or Don, and must of course have been only a forest running through the centre of Russia, as the ancients often confounded mountains and forests under the same appellation. Pauda, one of the highest mountains of the Uralian chain, is reported by Mr. Gmelin to be about 4512 feet above the level of the sea, an inconsiderable height, when compared with M. Blanc or M. Rosa. The central part of this chain abounds in metals, from Orenburg on the S. to the neighbourhood of Perm, where on the Asiatic side are Venchoutury on the N., Ekatarinenburg on the S., places remarkable for opulent mines. The highest ridges are chiefly granite, gneiss, and micaceous schistus, while the exterior hills of the chain on the W. are as usual calcareous. Serpentine, jasper, and trap, are also found, with argillaceous schistus, and other varieties, to be expected in so long a chain. The woods are chiefly pine, fir, birch, cedar, larch, aspin, alder, and on the S. W. sides are a few oaks, elms, and lindens.

Ural.

Forests.

European Russia is so abundant in forests that it would be in vain to attempt to enumerate them. There are prodigious forests between

* Pennant, A. Z. i. 158. Pallas in his travels, Paris 1793, 8 vols. 8vo. gives an account of these mountains. In his third volume he says, that the name *Oural Taou* signifies mountains of the belt; but, according to others, *Ural* means an eagle. Pallas says, that the eastern side presents petrosilex, jasper, slate, and argillaceous schistus rich in minerals. There is one mountain of mica, and another of asbestus, called the Silken Mountain.

Petersburg and Moscow, and others between Vladimir and Arzomas. Further to the S. there seems to have been a forest of still greater extent, probably as already mentioned the Riphæan forest of antiquity, in the direction of the rich black soil so remarkable for its fertility.* FORESTS.

When we consider the vast extent of territory comprehended under the European sovereignty of Russia, from the frozen shore of Archangel to the delicious climate of the Crimea, and that the whole of this great empire has scarcely produced a single naturalist of any eminence, all that is known of its vegetables, animals, and minerals, being collected for the most part within the last forty years by a few foreigners, under the munificent patronage of Catharine II., it will be evident that the rudiments alone of the Russian flora can as yet be extant. The provinces bordering upon the Baltic, and the newly acquired government of Taurida, have been examined with some attention, and a few striking features of the botany of the interior of the country have been described by travellers: but many years of patient research must elapse before the natural history of Russia is advanced to an equal degree of accuracy with that of the western parts of Europe.† Botany.

The Russian provinces N. of the Baltic, contain the same plants as those of Swedish and Norwegian Lapland, which will be hereafter described. Such as extend between the 50th and 60th deg. lat. abound principally in the common vegetables of the N. of France and Germany, some of which, however, are wanting, on account of the greater severity of the Russian winters from their proximity to the vast plains of Tatary and the forests of Siberia. The trees of most use and in greatest abundance are *the fir*; the *Scotch pine*; the *yew-leaved fir*; and the *larch*: all of which mingled together, form the vast impenetrable forests, whence the rest of Europe is principally supplied with masts, deals, pitch, and tar. The other forest trees are the *elm*; the *lime*, of the inner bark of which the Russian mats are made, and from whose blos-

* Mr. Coxe, Travels in Poland, &c. vol. i. 323. 341, describes the vast forest of Volkonski, as beginning near Viasma, and continuing almost to the gates of Moscow, as he travelled through it without interruption for 150 miles. He says that the Volga, Duna, and Dnieper arise in this immense forest, which consists of oaks, beech, mountain-ash, poplar, pines, and firs, mingled together in endless variety.

† Pallas, Flora Russica. Gilibert, Flora Lithuanica. Gorter, Flora Ingrica.

soms

Botany. ſoms the immenſe ſwarms of wild bees collect the chief part of their honey; *the birch*; the *alder*; the *aſpen*; the *greater maple*; and the *ſycamore*: of the ſhrubs and humbler plants, thoſe of moſt importance are *mountain-aſh*, from whoſe berries by fermentation and diſtillation an ardent ſpirit is obtained; the *cloudberry*; the *cranberry*; the *bearberry*; and the *ſtone bramble*; the fruit of all which, for want of better, is highly eſteemed, and is either eaten freſh or is preſerved in ſnow during the winter: the *Angelica*, whoſe ſucculent ſtalks when candied form a favourite conſerve with moſt of the northern nations; as well as the following vegetables, moſt of which are either found only in our flower gardens, or are of rare occurrence in a truly wild ſtate in Britain, *pyramidal bell-flower*; the *holly-hock*; *Moldavian balm*; *evening primroſe*; *mezereon*; and *hepatica*.

Quitting the pine foreſts of the N. and middle of Ruſſia, if we turn our attention to the few vegetable productions that have as yet been noticed amidſt the myriads that adorn and enrich the broad vales of the Don and the Dneiper, that glow upon the warm ſhores of the Black Sea, or luxuriate in the delicious receſſes of Taurida, we ſhall ſee what a rich harveſt is reſerved for future naturaliſts, and with what eaſe the inhabitants, when once become civilized, may avail themſelves of the uncommon bounties of their ſoil. Here riſes in ſtately majeſty for future navies the oak, both the common kind and the ſpecies with prickly cups; the *black* and the *white poplar*, of unuſual ſize, ſkirt along the margins of the ſtreams: the *aſh*; the *horn-beam*; the *nettle tree*, occupy the upland paſtures, and the elegant *beech*, crowns the ſummits of the limeſtone ridges. Of the fruitbearing ſhrubs and trees, beſides the *gooſeberry*, the *red*, the *white*, and the *black currant*, which are diſperſed in abundance through the woods, there are the *almond* and *peach*; the *apricot* and *crab-cherry*; the *medlar*; the *walnut*; the *mulberry*; the *olive*; the *fig*; the *vine*; and the *pomegranate*. Of the ornamental ſhrubs and plants the following are the moſt diſtinguiſhed, the *dwarf almond*; the *laurel*; the *pyracantha*; the *bay-tree*; the *common and ſhrubby jaſmine*; and the *tamariſk*.

Zoology. The zoology of Ruſſia is vaſt and various, and only a very ſlight ſketch can here be attempted. The more peculiar animals are the ſea bear

bear of Novaia Zemlia, and the ſouſlik of the S. In the more northern parts are found the wolf, the lynx, the elk; nor is the camel unknown in the lower latitudes. The animals in the centre ſeem common to the reſt of Europe. Among the more uſeful animals the horſe has met with deſerved attention, and the breed in many parts of the empire is large, ſtrong, and beautiful. Near Archangel are found poneys, or ſmall horſes, as in the northern latitudes of the Britiſh dominions; but Lithuania produces ſteeds of great ſtrength, while thoſe of Livonia excel in ſpeed; the ſpirit and beauty of the Tatarian horſes have been long celebrated, and have been improved in Taurida by the introduction of Turkiſh and Arabian ſtallions. Yet numbers of horſes are annually imported at Peterſburg. Zoology.

Even the country near Archangel is remarkable for excellent paſturage and fine cattle, which may be ſaid in general to abound in the empire. The ſheep in the northern provinces are of a middle ſize, ſhort-tailed, and the wool coarſe; nor is proper attention paid towards improving the breed. Thoſe in the S. are long-tailed, and yield a ſuperior wool; but the beſt is from the ancient kingdom of Kazan, and other regions in the eaſt of European Ruſſia. The iſlands of Oeſel and Dago have an excellent breed, with wool equal to the Engliſh. In Taurida it is ſaid that common Tatars may poſſeſs about 1000 ſheep, while an opulent flock is computed at 50,000: thoſe of the whole peninſula were ſuppoſed to amount to 7,000,000. The mutton excellent, but the wool coarſe, though the lambs' ſkins be valued for their fur. Goats and ſwine alſo abound throughout European Ruſſia; nor is the reindeer unknown in the furtheſt N.; ſo that the empire may be ſaid to extend from the latitude of the rein-deer to that of the camel.

The chief mines belonging to Ruſſia are in the Aſiatic part of the empire, but a few are ſituated in the European, in the mountains of Olonetz; and there was formerly a gold mine in that region near the river Vyg. In the reign of Ivan Baſilowitz, the Engliſh in 1569, obtained the privilege of working mines of iron, on condition that they ſhould teach the Ruſſians this metallurgy. During the reign of Alexis, the firſt regular mines were eſtabliſhed in Ruſſia, about 60 miles from Moſcow, and they are ſtill continued: but Peter the Great was the Mineralogy.

 founder

MINERALOGY.

founder of the Ruſſian mineralogy, by the inſtitution of the College of mines in 1719; and copper and iron were ſucceſsfully wrought in the territory of Perm. About 1730 the rich mines began to be diſcovered in the Aſiatic part of the empire, the deſcription of which is reſerved for the ſecond volume of this work. In 1739 gold was firſt obſerved in the chain of Olonetz, as already mentioned; and the mines of Voytzer near the Vyg were opened, but with little ſucceſs, as they only yielded about 57 pounds of gold in the year, which hardly recompenſed the price of labour.[5] This noble metal ſeems to require the full power of the ſun; and gold mines have rarely ſucceeded at a diſtance of more than 50° from the equator.*

Mineral Waters.

European Ruſſia being a plain country can boaſt of few mineral waters. There is a hot ſpring near Selo Klintſchy, in the government of Perm: and a noted chalybeate in the village of Buigova in the diſtrict of Olonetz, called St. Peter's Well, by Peter the Great, who erected near it ſome houſes and a church. The ſoil is ſo ſtrongly impregnated with iron, that roots of trees and other vegetable ſubſtances have been often found, converted as it were, into ores of that metal. But the moſt celebrated is near Sarepta on the Volga, diſcovered in 1775. The ſprings are here numerous and copious, and ſtrongly impregnated with iron. In the diſtrict of Perekop, and on the iſle of Taman, belonging to the government of Taurida, there are ſprings of Naphtha.[6]

Natural Curioſities.

The natural curioſities of Ruſſia in Europe have ſcarcely been enumerated, except thoſe which indicate the ſeverity of winter in ſo northern a clime. Not to mention the rocks of ice, of many miles in extent and ſurpriſing height, which navigate the frozen ocean, adorned like cathedrals with pinacles, which reflect a thouſand colours in the ſun, or Aurora Borealis; it is well known that the empreſs Anne built a palace of ice, on the bank of the Neva, in 1740, which was fifty-two feet in length, and when illuminated had a ſurpriſing effect. The thirteen cataracts of the Nieper, about 300 miles above its eſtuary,

[5] Tooke, iii. 402, &c. The chief iron mines are at Dougna near Smolenſk.

* M. Romme brought from the ſhores of the White Sea a yellow aventurine, of which I ſaw ſpecimens at Paris, but which did not ſeem ſo beautiful as the red aventurine.

[6] Tooke, i. 283.

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are compoſed of ſucceſſive banks of granite, which project through the bed of the river; and in the government of Olonetz other curious cataracts may be found. In the ſame region, near thoſe mountains which abound with iron, are found various fragments of birch trees and other vegetables mineralized by that metal, while the texture of the wood remains viſible, and the tender white rind, which ſtrongly reſiſts corruption, preſerves its original appearance. The ſoil is changed into ferruginous earth, and the graſſy ſod becomes iron ore.[7] NATURAL CURIOSITIES.

RUSSIAN ISLES.

THE ſmall iſle of Cronſtadt, in the gulph of Finland, was formerly called Retuſavi, and is only remarkable for an excellent haven, ſtrongly fortified, the chief ſtation of the Ruſſian fleet. In the Baltic, Ruſſia alſo poſſeſſes the iſlands of Oeſel, and Dago, which are of a conſiderable ſize but full of rocks: the marble of the firſt iſland is however beautiful. Both iſles are chiefly peopled by Eſtonians.

There are ſeveral iſles near the ſhore of Ruſſian Lapland, and in the White ſea, but generally barren and uninhabited rocks. Novaya Zemlia, or the New Land is alſo uninhabited, and is ſaid to conſiſt of five iſles, but the channels between them are always filled with ice.[8] Seals, walruſes, arctic foxes, white bears, and a few rein deer, conſtitute the zoology of this deſert; and are occaſionally hunted by the Novaya Zemlia.

[7] Tooke, i. 109. In the journey of the elder Gmelin to Siberia in 1733, of which a French tranſlation is given in the firſt ſupplement to the *Hiſtoire Generale des Voyages*, forming in the French edition the eighteenth volume, 4to., and the twenty-fourth of the Dutch, there is p. 105. a plan and deſcription of the large and curious grotto of Kungur, on the weſtern ſide of the Uralian mountains. There is alſo, p. 493, an intereſting account of the Samoieds who firſt appear beyond the river Mezen, about three hundred miles to the eaſt of Archangel. It is a ſingularity, p. 503, that the Samoied girls are married at the age of ten years, thus correſponding with the Sicilian in the furtheſt ſouth of Europe.

[8] Pennant, Arc. Zool. clx.

Russian Isles.

people of Mezen. To the ſouth of Novaya Zemlia is the ſea of Cara, (Karſkoye) in which the tide flows about two feet nine inches.*

Spitzbergen.

The remote and dreary iſlands of Spitzbergen having been taken poſſeſſion of by the Ruſſians, they may be here briefly deſcribed. This country has by ſome been ſtyled New Greenland, a name which accurately belongs to the weſtern ſide of Greenland proper, in North America, while the eaſtern ſide is called Old Greenland, as having been anciently planted by the Danes, though ſince blocked up by ice. The main land of Spitzbergen extends about 300 miles, from the ſouth cape, lat. 76° 30′, to Verlegan-Hook, lat. 80° 7′. In an adjacent ſmall iſle are ſaid to be baſaltic columns, from 18 to 20 inches in diameter, and moſtly hexagonal.[9] Driftwood is frequent in theſe northern latitudes, partly perhaps from the banks of the Ob, and partly from America, there being a ſtrong current from the Weſt-Indies to the N. E. Spitzbergen is ſuppoſed to have been firſt diſcovered by the Dutch navigator Barentz in 1596. The mountains are of granite and grit, the higheſt not exceeding 4000 feet; for mountains in general decline in height towards the poles. The icebergs, or glaciers, in the N. E. of Spitzbergen, preſent a ſingular appearance, being high cliffs of an emerald colour, impendent over the ſea, with cataracts of melted ſnow, and a back ground of black conic hills ſtreaked with white. The ſea itſelf contains mountains of ice, formed by aggregation; a large field forcing a ſmaller out of the water till it lodge upon the ſuperior ſurface, and the height is afterwards increaſed by the ſnow, till it ſometimes riſe to 1500 feet. The ſnow in theſe high latitudes often falls as hard, and minute as fine ſand. About the firſt of November the ſun ſets, and appears no more till the beginning of February; and after the beginning of May it never ſets till Auguſt. Coals are found in Spitz-

* In the firſt volume of the *Voyages pour l'Etabliſſement de la Compagnie des Indes*, Amſt. 1716, 8vo. there is a curious account of the voyage of the Dutch to Novaya Zemlia, 1596, where they wintered. This ſingular and intereſting narrative is unaccountably omitted in the *Voyages au Nord*, where there are ſeveral that rather belong to this collection. Both are miſerable compilations of Bernard a French bookſeller in Holland.

But as we are there informed, I. 194, it was Burroughs, an Engliſhman, who diſcovered Novaya Zemlia in 1556, according to Pontanus in his Diſſertation here printed. In 1553, Willoughby was frozen to death at the mouth of the river Petſora, in the north of Ruſſia, not in Lapland.

[9] Pennant, Arct. Zool. cxxxii.

bergen,

bergen, but even the vales are covered with eternal ice or ſnow. The only tree is the dwarf willow, which riſes to the height of two inches, towering with great pride above the moſſes, and lichens, and a few other cumbent plants. Here are found polar bears, foxes, and reindeer, with walruſes, and ſeals. There are a few kinds of water fowl; but the whale is the lord of theſe arctic ſeas. The Ruſſians from Archangel maintain a kind of colony; and that northern region ſeems indeed to have a natural right to Spitzbergen. To the N. E. of this dreary group are the ſmall iſles, called the Seven Siſters, the moſt arctic land yet diſcovered; and the dangers which Mr. Phipps, afterwards Lord Mulgrave, ſuffered near the Seven Siſters are well deſcribed in the account of his voyage.

RUSSIAN ISLES.

AUSTRIAN DOMINIONS.

CHAPTER I.

Historical Geography.

Names.—Extent.—Boundaries.—Original Population.—Progreſſive Geography.—Preſent Boundaries.—Hiſtorical Epochs and Antiquities.

THE dominions ſubject to the houſe of Auſtria embrace many ancient kingdoms and ſtates, which, for the ſake of perſpicuity, are here brought under one point of view; it having been urged as a reproach to modern geography, that by the obſtinate retention of antiquated diviſions, and the confuſed minuteneſs of ſeparate deſcriptions, it has not made an uniform progreſs with modern hiſtory, and politics, which it ought to illuſtrate. Hence, to uſe the preſent inſtance, many are led to imagine that the power of the houſe of Auſtria is chiefly founded on its bearing the imperial title, whereas, if reduced to the regal ſtyle of Hungary, its hereditary domains entitle it to rank among the chief European powers, being of wide extent, and great importance, and boaſting a population of not leſs than 20,000,000, more concentrated than the diffuſe population of Ruſſia, and perhaps the next power to France, not in arms only, but on the broad and deep-rooted baſis of compact numbers of inhabitants.

In deſcribing a ſovereignty, thus compoſed of many ancient ſtates, it may ſeem proper to pay the firſt and chief attention to that part which gradually ſpread its domination over the reſt, or in other words,

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that which was the earliest important inheritance of the ruling family. The remaining provinces will of course be considered in proportion to their real and lasting importance; while the more minute districts may be abandoned to the sedulous care and microscopic labour of the topographer. On this plan the provinces that will here require particular observation are the archduchy of Austria; the kingdoms of Hungary, and Bohemia; the grand-duchy of Transylvania, which, with the Buckovina, may be regarded as belonging to Hungary; and lastly that part of Poland which has fallen under the Austrian sceptre.

The archduchy of Austria may be considered as belonging, in part, to ancient Pannonia, the Vindobona of the Romans being the modern Vienna. But that half of Austria, which lies north of the Danube, was occupied by the Quadi, a barbaric nation, who anciently infested the adjoining provinces of Pannonia and Noricum; for the western part of Austria, on the S. of the Danube, falls under the latter ancient appellation. The German name and division of Osterich,* or the eastern kingdom, softened into Austria by the Italian and French enunciation, arose after Charlemagne had established the western empire, being a remnant of the sovereignty of what was called Eastern France, established by that conqueror. It was also styled *Marchia Orientalis*, the eastern march, or boundary: and after the failure of the Francic line became a marquisate feudatory to the dukes of Bavaria, till the emperor Frederic Barbarossa, in 1156, constituted it a duchy held immediately of the empire.[1] Hungary, a part of which belonged to ancient Dacia, derives its modern appellation from the Ugurs, a Finnish nation, who, after spreading devastation through a great part of Germany, fixed their residence here in the tenth century; the writers of the middle ages, confounding their real appellative with that of the Huns, a different and here extinguished nation, who had formerly possessed this province. In the time Charlemagne it was possessed by the Avars, a Slavonic people.[2] The Hungarians style themselves Magiar; and their language

Names.

* Several of the German names of Austrian provinces differ considerably from our appellations: Carinthia is *Carnten* (Brown, 125); Carniola, *Krain*; Stiria, *Steyermark*; Croatia, *Crabaten*; Bohemia, *Boehmen*; Moravia, *Mahren*. Galitz, or Galitzia is wrongly styled Gallicia.

[1] D'Anville, Etats formés en Europe, p. 51.

[2] Gibbon, x. 204.

approaches

NAME. approaches to the Finnic dialect. Bohemia, or the habitation of the Boii, was a central province of Barbaric Germany, afterwards seized by a Slavonic tribe, whose chiefs were originally styled dukes of Bohemia. Transylvania, and the Buckovina* are parts of the province of Dacia, founded by Trajan. The former is by the Hungarians called Erdeli: by the Germans Sieben-burgen, or the Seven towns, from a colony there established: the more common name seems derived from the woody passes of the Carpathian mountains, and was imposed by the monkish writers. The origin of the other names becomes difficult, in exact proportion to their unimportance; and is more fit for the investigation of the antiquary, than for the present design.

Extent. From the frontiers of Swisserland, to the utmost limits of Transylvania, the length of the Austrian dominions may be about 760 British miles; the breadth about 520, from the river Bug, which forms a boundary between Austria and Prussian Poland, to the Save, which divides the Austrian from the Turkish sovereignty. The square contents may be about 184,000 mile. Boetticher estimates the inhabitants at 108 to a square mile; but since he wrote, the Netherlands, a populous region, seem to be withdrawn from the house of Austria.

Towards the E. the Austrian dominions border on those of Russia and Turkey, and to the N. on those of Prussia, Upper Saxony, Bavaria,† and Swabia. On the utmost W. are Swisserland and Italian states.

The state of the Austrian dominions has been considerably changed by recent events. Venice has become a part of the kingdom of Italy; and the blindness of Austria towards this venerable republic may be regarded as absolute infatuation. Tyrol has been assigned to the elector, now king, of Bavaria; who also shares with the new king of Wirtemberg the Austrian possessions in Swabia. Such are the most essential terms of the treaty of Presburg, 26 December 1805. The counties of Salzburg

* This province became subject to Austria in 1777, and was annexed to Galitz. Inhabitants about 130,000, who speak Polish, and German: Religion, Roman Catholic.

† Since 1779 the boundary between Austria and Bavaria is the river Inn, with part of the Salza, a small district being acquired by Austria, which is called the Inn-Viertel.

The county of Gorz, with some surrounding territory extending on the west of the river Judri, is called Friaul, or the Austrian Friulese, in the maps published at Vienna 1796.

and

and Berchtolsgaden are incorporated with the empire of Auſtria. By this remarkable treaty the Auſtrian emperor, EXTENT.

" Cedes and abandons to his majeſty the king of Bavaria the Margraviate of Burgau, and its dependencies; the principality of Eichſtadt; the part of the territory of Paſſau, belonging to the elector of Salzburg, and ſituated between Bohemia, Auſtria, the Danube, and the Inn; the country of Tyrol, comprehending therein the principalities of Brixen and Botzen, the ſeven lordſhips of the Voralberg, with their detached dependencies; the county of Hohenems, the county of Konigſegg, Rottenſels, the lordſhips of Tetnany and Argen, and the town and territory of Lindau.

" To his majeſty the king of Wirtemberg, the five cities of the Danube, to wit, Chingen, Munderkengen, Ruſſlingen, Menzen, and Salgaw, with their dependencies, the city of Conſtance excepted; that part of the Briſgaw which extends in the poſſeſſion of Wirtemberg, and ſituated to the eaſt of a line drawn from Schlegelburg to Molbach, and the towns and territories of Willengen and Brentengen. To his moſt ſerene highneſs the elector of Baden, the Briſgaw (with the exception of the branch and ſeparate portions above deſcribed), the Ortenſaw and their dependencies, the city of Conſtance, and the commandery of Meinau."

It has been aſſerted that Auſtria was to be partly indemnified for theſe important ceſſions by the acquiſition of Boſnia and Servia from the Turks; but as the French have ſeized on Cattaro, and the Dalmatian territories of the former republic of Venice, it may be doubted whether her policy would permit the increaſe of the power of Auſtria in that quarter.

The original population of theſe extenſive regions is various, but chiefly Gothic and Slavonic. The native ancient Germans, a Gothic race, form the ruling, moſt induſtrious, and moſt important part of the inhabitants. Bohemia and Moravia were originally Slavonic kingdoms; and the people of Poland and Hungary may be generally referred to the ſame origin; for in the latter kingdom the Magiars, or Ugurs,* who uſe a dialect approaching the Finniſh, did not ſupplant Original Population.

* Whence perhaps the terrible *Ogres*, and *Ogreſſes* of heraldry, which commenced ſoon after the cruel incurſions of theſe people.

ORIGINAL POPULATION.

the Slavons, whom they found in the country; and who, on the fall of the Roman empire, had ſucceeded the Dacians, a Gothic race.

Progreſſive Geography.

The progreſſive geography of the ſouthern part of the Auſtrian dominions commences at an early period. Yet the Adriatic was not a favourite ſea of the Greeks; and the Roman writers throw the firſt ſteady light upon theſe regions. Paſſing from Ciſalpine Gaul, in defiance of the barriers of the Rhætian, and Carnic, or Julian Alps, now the mountains of Tyrol, Carinthia, and Carniola, the Roman generals ſubdued many barbarous tribes; and founded the provinces of Noricum, and Pannonia, their moſt northern acquiſitions in this quarter, till Trajan added Dacia. The Rhætians were ſubdued by Druſus, in the reign of Auguſtus, under whoſe ſway, or rather in the time of his ſucceſſor Tiberius, Pannonia and Noricum alſo became provinces of the Roman empire. Concerning thoſe regions much information may be derived from the luminous page of Tacitus; and ſoon after, the geography of Ptolemy opens additional illuſtrations. The common reſources of ancient geography are continued by the Byzantine writers; and, after the age of Charlemagne, by many hiſtorians of the weſt. Since the invention of printing to the preſent period, the geography of theſe extenſive provinces has been gradually improved, though not with the rapidity which might have been expected, as they unfortunately have not produced many men of acute genius, extenſive learning, or exact ſcience; and the beſt accounts are derived from writers in the N. of Germany, or from foreign travellers.*

Hiſtorical Epochs.

The hiſtorical epochs of various kingdoms and ſtates, recently united under one ſovereignty, muſt of courſe be ſubdivided into their original diſtinct portions, beginning in the order above-mentioned, with the firſt important ſtate, around which, as a nucleus, the others are conglomerated; but proceeding thence to the other provinces, according to their modern extent, and importance.

1. The houſe of Auſtria, which, by ſucceſſive fortunate marriages ſince the fifteenth century, has ariſen to ſuch a ſummit of power, is

* Even one of the laſt maps of Hungary, that by the Artarian ſociety, Vienna, 1792, is meanly executed, and very defective in diſplaying the chains and altitude of mountains, which are laid down as they might have been a century ago.

well known to have ſprung from the humble counts of Hapſburg. Thoſe lords poſſeſſed a ſmall territory in Swiſſerland, in the northern corner of the canton of Bern, near the river Aar, about three miles S. of the town of Bruck, and the ſame diſtance to the N. of Mellingen.[3] On a lofty eminence, crowned with beech, ſtands an ancient tower, the firſt ſeat of the houſe of Auſtria. In the twelfth century Otho is deſigned count of Hapſburg, and even heraldry can ſcarcely aſcend beyond his grandſire Radebot, brother of Werner, biſhop of Straſburg. In 1273 Rodolph of Hapſburg was called to the imperial throne, after an inter-reign, during which the German potentates had increaſed, and ſecured their own power; and wiſely preferred a nominal ſovereign, whoſe humble extract, and ſmall poſſeſſions, could afford no check to their ambition. Yet Rodolph was at this time lord of the greater part of Swiſſerland; after the extinction of the powerful houſe of Zaeringen, and that of the counts of Kyburg, whoſe joint inheritance devolving to Rodolph, became the baſis of his power, and that of his ſucceſſors.[4]

HISTORICAL EPOCHS.

2. Another emperor of the houſe of Auſtria appeared in Albert, A.D. 1298; from whom the Swiſs made their ſignal revolt in 1307. His ſon Frederic was obliged to yield the empire to Louis of Bavaria.

3. Albert II duke of Auſtria, A. D. 1438, ſucceeded to three crowns, on the death of his father-in-law the emperor Sigiſmond, thoſe of Hungary, and Bohemia, and that of the empire by unanimous election. This was the epoch of the laſting grandeur of the houſe of Auſtria. Yet his ſucceſſors Frederic III, and Maximilian I, were feeble princes; and Charles V firſt aſtoniſhed Europe with a real diſplay of Auſtrian power.

4. Maximilian having married the heireſs of Burgundy, the Netherlands became ſubject to the houſe of Auſtria in 1477; and his ſon Philip, in 1496, marrying the heireſs of Arragon and Caſtile, the ample dominions of Spain fell afterwards under the Auſtrian ſceptre. Charles V inherited all theſe domains; but on his reſignation Spain and the Netherlands paſſed to his ſon Philip II, and the former crown continued in the Auſtrian line till the cloſe of the ſeventeenth century.

[3] Coxe's Swiſſerland, i. 135. [4] Planta's Swiſſ. i. 170.

Historical Epochs.

Auſtria, Bohemia, and Hungary, paſſed to Ferdinand the brother of Charles V, who was alſo choſen emperor of Germany.

5. The noted bigotry of the houſe of Auſtria was not confined to the Spaniſh branch, for though Maximilian II, about 1570, had granted liberty of conſcience even to the proteſtants of Auſtria, yet thoſe of Bohemia, and other parts, were afterwards ſo much oppreſſed, that the proteſtant princes of Germany called in Guſtaf Adolf, the celebrated Swediſh monarch, to their aſſiſtance, who ſhook the empire to its very foundations. Even France ſupported the proteſtants, in the view of weakening the Auſtrian power; and the war continued till 1648, when the famous treaty of Weſtphalia was ſigned, which has ſerved as a baſis for other diplomatic tranſactions.

6. The war with France was often rekindled during the long reign of Leopold I, 1658, to 1705; and in 1683 the Turks were ſo ſucceſsful as to lay ſiege to Vienna.

7. His ſon Joſeph I joined the allies againſt France, and ſhared in their ſucceſs. He married the daughter of John Frederic duke of Hanover.

8. By the death of the emperor Charles VI, on the 20th October, 1740, without male iſſue, the houſe of Auſtria became extinct. The elector of Bavaria ſeized the kingdom of Bohemia, and was elected emperor in 1742, but died in 1745.

9. Francis of Lorrain, ſon of Leopold duke of Lorrain, having married Maria Thereſa, daughter of the emperor Charles VI, ſucceeded to the Auſtrian dominions, which continue to be held by his deſcendants. In 1745 he was elected emperor, and his ſucceſſors have enjoyed the imperial crown, as if hereditary. The powerful houſe of Lorrain is of great antiquity, deſcending from Gerard count of Alſace, in the eleventh century, whoſe origin is referred to a collateral branch of the houſe of Auſtria.

10. The reign of the emperor Joſeph II, a beneficent but impetuous prince, whoſe grand deſigns of reformation were fruſtrated by his ignorance of the inveteracy of habits and prejudices, which muſt ever be conſidered in a due eſtimate of human affairs.

11. The

11. The obdurate and ſanguinary conteſt with France, the events of which are known to all. HISTORICAL EPOCHS.

Having thus briefly marked the chief epochs of the Auſtrian power, the events of the ſubject kingdoms and ſtates muſt be as much compreſſed as poſſible. The next in importance are thoſe of the kingdom of Hungary.

1. The Roman province of Dacia. The conqueſt by the Huns; and afterwards by the Avars, and other Slavonic tribes.

2. The conqueſt by the Ogurs, or the Magiars, who continued under dukes from their firſt ſettlement in 884.

3. St. Stephen firſt king of Hungary, A. D. 1000. The crown is partly elective, and partly hereditary; and among the chief hiſtorical events are the wars in Dalmatia, againſt the Venetians.

4. Louis I, ſurnamed the Great, A. D. 1342, ſubdues a great part of Dalmatia, and carries his arms into Italy. He was ſucceeded by his daughter Mary, who was ſtyled *King* of Hungary; but dying in 1392, the ſucceſſion became controverted, and at leaſt terminated in the election of Sigiſmond, marquis of Brandenburg, who had wedded Mary the heireſs. In 1411 he was choſen emperor of Germany.

5. Albert of Auſtria having wedded Elizabeth the heireſs of Sigiſmond, was, with her, crowned king and queen of Hungary, 1438: an event which forms the earlieſt baſis of the Auſtrian claim to the Hungarian monarchy. Upon the death of Albert, Ladiſlas, king of Poland, is alſo choſen king of Hungary, but periſhes in the battle of Werna againſt the Turks. The famous John Hunniades is appointed regent of the kingdom.

6. On the death of another Ladiſlas, the poſthumous ſon of Albert of Auſtria, in 1457, the celebrated Mathias Corvinus, ſon of Hunniades, is proclaimed king of Hungary by the ſtates, aſſembled in the plain of Rakos, near Peſt. In 1485 he ſeized Vienna, and the other Auſtrian ſtates, and retained them till his death in 1490. Mathias was the greateſt prince who had ever held the Hungarian ſceptre, brave, prudent, generous, the friend of arts and letters, and a man of letters himſelf. He founded a magnificent library at Buda, and furniſhed it with the beſt Greek and Latin books, and many valuable manuſcripts.

7. After

Historical Epochs.

7. After repeated contests, the house of Austria again fills the throne of Hungary, in the person of Ferdinand, 1527, but towards the end of his reign the Turks seized on the greater part of this kingdom. On his being chosen emperor of Germany, Ferdinand retained the crown of Hungary till 1563, when he resigned it to his son Maximilian; and it has since continued a constant appanage of the house of Austria.

The grand-duchy of Transylvania was considered as a part of Hungary till 1540, when, in consequence of a treaty between the Vaivod, and Ferdinand of Austria, Transylvania began to be regarded as a distinct state. Stephen Battori having been elected prince of Transylvania in 1571, that family continued to hold this petty sovereignty till 1602, after which it continued subject to several elective princes, of whom the most distinguished was Bethlem Gabor, or Gabriel Betlem, a noble Hungarian, and a Calvinist, who conquered a great part of Hungary in 1619, and died in 1629. The last prince of Transylvania was Michael Abaffi, the second of that name, who yielded the sovereignty to the emperor in 1694, since which period this country has formed a part of the Austrian dominions.

The historical epochs of the kingdom of Bohemia deserve more attention.

1. In the seventh century the Slavons seizing on Bohemia were ruled by chiefs, or dukes, seemingly hereditary, at least after Borzivoi, who embraced Christianity in the year 894. In the eleventh century Bretislas subdued the little adjacent kingdom of Moravia.

2. Vratislas duke of Bohemia is honoured with the regal title by the emperor Henry IV in 1086; who at the same time invested him with the domains of Lusatia, Moravia, and Silesia. But this dignity was personal; and the constant title of king only dates from Premislas II in 1199. He and his immediate successors, are styled Ottocari, from their zeal in the cause of the emperor Otto.

3. One of the most renowned monarchs was another Premislas Ottocar, who ascended the throne in 1253, seized Austria, and Stiria, and other provinces to the south, and carried his arms into Prussia. In 1271 he refused the imperial crown, which was afterwards given to Rodolph count of Hapsburg, who insisting on the restitution of the Austrian

Auſtrian ſtates, Ottocar ſaid that he had paid Rodolph his wages, and owed him nothing: for that count had been his marechal, or maſter of the horſe. A reconciliation was effected by matrimonial alliances, and by Ottocar's receiving the inveſtiture of Bohemia, and Moravia, on renouncing Auſtria, Stiria, and Carinthia. His ſon Wenceſlas was elected king of Poland; but refuſed the ſceptre of Hungary in favour of his ſon. Historical Epochs.

4. The ancient lineage having failed, John count of Luxembourg, who had married a daughter of Bohemia, became king in 1310, and was ſlain at the battle of Creci, fighting againſt the Engliſh in 1346. His ſon and ſucceſſor, Charles, was alſo emperor of Germany.

5. In the reign of Wenceſlas VI king of Bohemia, and emperor, John Huſs having read the books of Wickliffe the Engliſh reformer, introduced his doctrines into Bohemia. He was condemned to the flames in 1415. The Bohemians and Moravians have ſince become remarkable for various ſects of religion, and conſequent inteſtine commotions. The Huſſites under Ziſka, repeatedly defeated the troops of their king Sigiſmond, brother of Wenceſlas, and alſo emperor of Germany.

6. Albert of Auſtria, having wedded the daughter of Sigiſmond, received the crowns of Bohemia and Hungary. But the ſucceſſion was afterwards controverted and infringed by George Podiebrad, (a Huſſite chief, who obtained from the weakneſs of the emperor Frederic III of the houſe of Auſtria, the crown of Bohemia in 1459,) by Vladiſlas ſon of the Poliſh monarch, and by Mathias king of Hungary.

7. Louis, ſon of Vladiſlas, ſucceeded his father in the kingdoms of Bohemia and Hungary; but being ſlain at the battle of Mohatz, 1526, the crown finally paſſed to the houſe of Auſtria.

The ancient monuments of the more northern kingdoms and provinces belonging to Auſtria, cannot be expected to be very numerous, or important. Vindobona, and the adjacent parts of Noricum and Pannonia, occaſionally diſplay Roman remains; but the ruins of the celebrated bridge of Trajan, over the Danube, belong to Turkey in Europe, being ſituated not far from Wildin, in Bulgaria: it is ſuppoſed to have conſiſted of twenty arches, or rather vaſt piers of ſtone, originally ſupporting a wooden fabric of the length of more than 3,300 Antiquities.

Engliſh

ANTIQUITIES.

Engliſh feet. In Hungary, and other parts of the ancient province of Dacia, appear many relics of Roman power, as military roads, ruins, &c. and an elegant hiſtorian remarks "that if we except Bohemia, Moravia, the northern ſkirts of Auſtria, and a part of Hungary between the Teyſs and the Danube, all the other dominions of the houſe of Auſtria were ſituate within the limits of the Roman empire."[5] Hungary, and the other provinces of the Auſtrian dominions, having been frequently expoſed to the ravages of war, many ancient monuments have periſhed; yet ſeveral caſtles, churches, and monaſteries ſtill atteſt the magnificence of the founders.[6] The cathedral church of St. Stephen, in Vienna, is a Gothic fabric of ſingular pomp, and minute decoration.

[5] Gibbon, vol. i. p. 22.

[6] Dr. Brown's Trav. p. ii. p. 30.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

THE preponderant religion of the Austrian dominions is the Roman Catholic, but attended with a considerable degree of toleration. Protestants of various sects are found in Bohemia, and Moravia; nor are Lutherans unknown at Vienna, though they chiefly abound in Transylvania,[1] nay in Hungary it is believed that the protestants are equal in number to the catholics.[2] Vienna did not become a metropolitan see till the year 1722: the archbishop is a prince of the holy Roman empire. The present state of the ecclesiastic geography, the number and boundaries of the bishoprics, &c. would require some investigation not interesting to the general reader.* RELIGION.

The form of government is an hereditary monarchy, and approaching to absolute power. For though Hungary retain its ancient states, or rather an aristocratical senate, yet the dominions being so various and extensive, and the military force wholly in the hands of the sovereign, no distinct kingdom or state can withstand his will; and except most oppressive measures were pursued, there can be no general interest to league against him. Even Austria has its states, consisting of four orders, clergy, peers, knights, burgesses; the assembly for lower Austria being held at Vienna, and that of the upper at Linz.[3] But those local constitutions can little avail against the will of a powerful monarch, supported by a numerous army. Government.

[1] Busching, vi. 540. [2] Townson, 181.

* Hungary, the principal province, contains two archbishoprics and fifteen bishoprics, including Bosnia and Croatia. The archbishop of Gran has about 36,000l. a year, the others do not exceed 8,000l.—Townson, i. 137.

[3] Busching, vi. 536. last French edition.

 The

Laws. The laws vary according to the different provinces, almoſt every ſtate having its peculiar code. The Hungarians in particular have vigorouſly defended their ancient laws, though in many inſtances illaudable, the peaſantry being in a ſtate of villanage till 1785.[4] Yet what is called the *Urbarium*, publiſhed by the Empreſs Thereſa in 1764, attempted with ſome ſucceſs to define the rights of the landlords, and of the peaſants, and was received for law. In 1786 Joſeph II after ſuppreſſing villanage in Bohemia and Moravia, extended the like freedom to Hungary; and this decree remains uncancelled, though many of the laws of that well-meaning, but injudicious monarch, expired with their author. Yet the boaſted freedom of Hungary is rather that of a powerful ariſtocracy, than of the people at large. In general the laws may be regarded as mild and ſalutary; and the Auſtrians in particular are a well regulated and contented people, while the Hungarians are often diſſatisfied, and retain much of their ancient animoſity againſt the Germans. As Hungary is the moſt important province of the monarchy, it might perhaps have been more prudent to have there eſtabliſhed the royal reſidence and ſeat of power, had not the repeated ſubjugation of a great part of that kingdom by the Turks rendered ſuch a deſign precarious.

Population. The general population of the Auſtrian dominions is computed at more than 20,000,000; that of Hungary, Tranſylvania, and the Buckovina, being eſtimated at four millions and a half. Yet ſome authors compute the population of Hungary alone at 7,000,000; and a late German author has in conſequence ſwelled the general population of the Auſtrian dominions to 25,000,000.[5] Hence, upon the whole, it will be reaſonable to allow 23,000,000 as a medial computation of the numbers ſubject to the Auſtrian ſceptre.

Of the other chief provinces, Bohemia is ſuppoſed to hold two millions and a half; and Moravia one million and a half. The whole acquiſitions in Poland may contain more than three millions;* while the archduchy of Auſtria is computed at 1,685,000.

[4] Townſon, 102. 107. [5] See Townſon, chap. v.

* Hoeck computes Eaſtern Galitz and Lodomiria at 2,797,119; and Weſtern Galitz at 1,106,178. But the loſs of Venice, Tyrol, and the Briſgaw, will not be eaſily repaired.

Auſtria may be regarded as an inland power, the ſmall harbour of Trieſte being little known in commerce. Hence no foreign colonies have been planted by the Auſtrians. **Colonies.**

The army is computed by Boetticher at 365,455 men, in 136 regiments, of which 46 are German, and only 11 Hungarian. This numerous army has been greatly diminiſhed in the ſanguinary conteſt with France; and perhaps could not, at preſent, equal that of Pruſſia, computed at 200,000; and far leſs that of the great military power of Ruſſia, doubling that number. **Army.**

An Auſtrian ſhip of the line would be regarded as a novelty on the ocean. **Navy.**

The revenue is computed at more than 10,000,000l. ſterling; to which Auſtria contributes about 3,000,000l., and Hungary a little more than a million and a half. This revenue uſed to exceed the expences; but the public debt now, probably, ſurpaſſes 40,000,000l. ſterling, and the recent wars have occaſioned great defalcations. **Revenue.**

Vaſt are the political importance and extent of the relations of the Auſtrian ſovereignty. Setting aſide the conſideration of his influence, as emperor, over the German ſtates, the monarch may be regarded as an equal rival of France, and only inferior to the preponderance of Ruſſia. Since the Auſtrian dominions and power have been ſwelled to their modern conſequence, a determined rivalry has exiſted between them and France, which has, with reaſon, been jealous of the Auſtrian ambition. Alliances, even cemented by intermarriage, have not been able to overcome the oppoſition of intereſts; and England being alſo the rival of France, it has frequently become an unavoidable policy to maintain this diſſenſion. There are alſo cauſes of confirmed jealouſy between Auſtria and Pruſſia; and it is doubtful if even an invaſion from Ruſſia would compel them to unite in a defenſive alliance. The inveterate wars with Turkey, and the radical difference of religion and manners, more impreſſive from vicinity, have alſo ſown irreconcilable hatred between the Auſtrians and Turks; and the ambition of Auſtria eagerly conſpires with Ruſſia againſt European Turkey. Amidſt ſo many enmities, and the neceſſary jealouſy of Ruſſian power, it would be difficult to point out any ſtate on the continent with which Auſtria could **Political Importance and Relations.**

POLITICAL IMPORTANCE, &c.

could enter into a ſtrict and laſting alliance. The moſt natural and conſtant may be that with England, whoſe maritime power might inflict deep wounds upon any enemy; but againſt Ruſſia an alliance with Pruſſia would be indiſpenſable.*

* Since this chapter was at the preſs, an important work has come to hand, intitulé *Aperçu Statiſtique des Etats de l'Allemagne; ſous le rapport de leur Etendue, de leur Population, de leurs Productions, de leur Induſtrie, de leur Commerce, et de leurs Finances; par Hoeck, Conſeiller de Juſtice du Roi de Pruſſe*, &c. Paris, An ix (1801), large folio. This work is certainly the moſt complete view, which has appeared, of the numerous and important German ſtates. But it is a great defect that there is no general ſum of the entire population, &c. &c. of each ſovereignty.

Bohemia is eſtimated at 2,806,493: Moravia 1,256,240: duchy of Auſtrian Sileſia 250,000: Auſtria 1,820,000: Stiria, &c. 1,645,000: Tyrol 610,000: Hungary 6,115,000: Illyria 1,035,000: Tranſylvania 1,443,364: Galitz, &c. 2,797,119: Weſtern Galitz 1,106,178: Bukovin 30,000. That is, in all, little more than 20 millions.

In like manner the Commerce, Army, Square Miles, Finances, are only particularized under each ſubdiviſion, without general eſtimates, a plan which leads to perplexity and additional labour, though the work be highly valuable in other reſpects.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs. — Language. — Literature. — Education.—Universities.—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

VARIOUS are the manners and customs of the numerous kingdoms and provinces subject to the house of Austria. Vienna, the capital, presents as it were an assemblage of nations, in their various dresses. In Austria proper the people are much at their ease: and the farmers, and even peasantry, little inferior to those of England. Travellers have remarked the abundance of provisions at Vienna, and the consequent daily luxury of food, accompanied with great variety of wines. The Austrian manners are cold, but civil; the women elegant, but devoid of mental accomplishments, the only books they read being holy legends.[1] The use of rouge is universal, but moderate; and the dress is singularly splendid. They retain the absurd fashion, universal on the continent, of dressing little girls like women, with the high powdered head, and the hoop. The manners somewhat partake of the Italian and Spanish cicisbeism, forming in this respect a kind of medium between the profligacy of the south of Europe and the decency of the north. The Austrian youth of rank are commonly ignorant, and of course haughty, being entire strangers to the cultivation of mind, and condescension of manners, to be found among the superior ranks of some other countries, a circumstance more striking to the English traveller in particular from the violence of the contrast. An Austrian nobleman or gentleman is never seen to read, and hence polite literature is almost un-

[1] Wraxall's Memoirs, ii. 240. &c.

Manners and Customs.

known and uncultivated; nor have the Auſtrians yet claimed any ſhare in its progreſs in Germany. Yet the emperor having long been conſidered as the higheſt power in Europe, the Auſtrians affect to conſider themſelves as ſuperior to other nations. It is to be regretted that a more rational mode of education is not followed, which would open their minds to the numerous delights and advantages ariſing from ſcientific purſuits, and deliver them from many vain ſuperſtitions, as they believe in ghoſts and familiar ſpirits, and in the idle dreams of alchymy. In conſequence of this ignorance the language remains unpoliſhed; and the Auſtrian ſpeech is one of the meaneſt dialects of the German, ſo that polite people are conſtrained to uſe French. The lower orders are, however, little addicted to crimes or vices, and puniſhments are rare: robberies are ſeldom committed, and murder little known. When capital puniſhment becomes unavoidable, it is adminiſtered with great ſolemnity, and accompanied with public prayers, an example worthy of univerſal imitation.

The next people in eſtimation, and the firſt in numbers, is the Hungarians. Their manners are now conſiderably tinctured by thoſe of the ruling Germans, but they remain a ſpirited people, and affect to deſpiſe their maſters. Their dreſs is well known to be peculiar, and is copied by our huſſars.[2] This dreſs, conſiſting of a tight veſt, mantle, and furred cap, is graceful; and the whiſkers add a military ferocity to the appearance. In other reſpects recent travellers do not ſeem to have been impreſſed with much diſtinction between the Auſtrian and Hungarian manners.

Language.

The languages ſpoken in theſe aggregated dominions are numerous and diſcrepant. They belong chiefly to three grand diviſions, the Gothic or German of the ruling nation, which will gradually exclude the others: the Slavonic of the Poles,* part of the Hungarians, the Dalmatians, &c. and alſo the ancient ſpeech uſed in Bohemia and Moravia: and laſtly the Hungarian proper, which has been conſidered as a branch

[2] In the Hungarian, *Huſzar* implies the twentieth, becauſe twenty peaſants are obliged to furniſh one horſeman to the cavalry. Buſch. iii. 56.

* Nor is it diſuſed in Bohemia, which may be regarded as the extreme weſtern limit of the Slavonic *tongue*; for the *people* extend to the mouth of the Elbe.

of

of the Finnic. Among people of rank at Vienna the French was formerly prevalent, as already mentioned; but this fashion is perhaps impaired by recent events, and the use of the polished German of Saxony would not only be more appropriate, but might tend to diffuse a national taste and native literature. Riesbeck observes that in Swabia, Bavaria, and Austria, the German is very impure. LANGUAGE.

The literary history of the Austrian dominions cannot ascend to a remote period. That of Austria proper, in particular, is little interesting, and even the chronicles and lives of saints are comparatively recent. If the emperor Maximilian, grandfather of Charles V, be the author of an eccentric poem alluding to the events of his own life, and usually ascribed to him, though many assign it to his chaplain, he may be considered as the father of Austrian literature, as well as of Austrian greatness. But the succession of authors is interrupted; and many of those who flourished at Vienna were aliens. Wolfgangus Lazius is but a dreaming antiquary: and in the same century Cuspinian has ridiculed Haselbach, the professor of divinity, who having begun a course of lectures on Isaiah, had not in twenty-one years finished the first chapter. The like perversity of taste continues to modern times; and Reisbeck has depicted in warm colours the metaphysical absurdities of the Austrian professors, and the abject tone of slavery and flattery which pervades even the little solid literature that is known.[3] For at Vienna the emperor is considered as the successor of Augustus, as absolute monarch of Germany; while in the other provinces of that wide region, he is more justly regarded as a nominal head, though highly respectable as king of Hungary and Bohemia. In the medical branch, Van Swieten, Storck, and others have acquired deserved celebrity: but though Vienna swarm with pretended literati, or men who can talk and write nonsense in Latin, there are a few who have acquired a shadow of reputation, such as Hell, Martini, Denis, and Sonnerfels; yet the first was a Silesian, and Denis from Bavaria. In antiquities occur the names of Froelich, and one or two other numismatic writers, who compose vast volumes upon small subjects. Literature.

[3] Travels, vol. i. 283.

Bohemia

LITERATURE.

Bohemia and Hungary have no ancient claims to literature. Cosmas of Prague, a venerable historian, flourished about the year 1130; and Hungary has a cotemporary father of history in the anonymous notary of king Bela.[4] Yet the encouragement given to writers by the celebrated Mathias Corvinus little stimulated native literature, for Bonfinius was an Italian. Nor is there any Hungarian writer particularly celebrated among the modern Latin classics; nor the native language yet known by any work commanding celebrity. Baron de Born, a native of Transylvania, has written many able works in natural history; but he used the Latin and French languages. An enquiry into the causes which have retarded the progress of letters and philosophy in the Austrian dominions, would be more useful than the bare enumeration of a few names: they would be found to arise partly from the coarseness of the German dialect, and the absence of the Slavonic and Hungarian from the learned languages of Europe; partly from numerous wars of ambition, which sometimes endanger the very existence of the state; in yet greater measure from the military education of the nobility, or rather indeed from their ignorance, for many consummate officers have been men of letters: but above all, this defect must be ascribed to that metaphysical bigotry, which perverts their rational powers, and blights every bud of genius and solid knowledge. The books prohibited at Vienna probably exceed in number those of the Roman Index Expurgatorius; and though the government have no doubt a right to watch over those of a political tendency, yet this jealousy needs not be extended to works of mere science, written by heretics. On the other hand, some blame must doubtless extend to authors who introduce into scientific productions their political dogmata, and visionary views of social perfection, with attacks upon established forms of worship and government, totally unlike the procedure of the ancient philosophers, who were teachers of content and moderation. Yet a government should select the happy mean between that fanatic bigotry, which alike freezes literature and every branch of industry; and that licentiousness of the press, which by wantonly sapping personal reputation,

[4] Katona, Hist. Crit. Hung. Proleg.

putation, and the laws, tends to deſtroy every habit of virtue, and can only lead to anarchy. LITERATURE.

The empreſs Thereſa inſtituted ſchools for the education of children, but none for the education of teachers. Hence the children are taught metaphyſics before they know Latin; and a blind veneration for the monks forms one of the firſt exertions of naſcent reaſon. Yet the example is highly laudable, and with all its diſadvantages may lead to important conſequences. Education.

The univerſities, like thoſe in other catholic countries, little promote the progreſs of ſolid knowledge. The ſciencies taught with the greateſt care, are preciſely thoſe which are of the ſmalleſt utility. The univerſity of Vienna has, ſince the year 1752, been ſomewhat improved. It was founded in 1237, and that of Prague in 1347; that of Inſpruck only dates from 1677, and Gratz from 1585.[6] Hungary chiefly boaſts of Buda, though the Jeſuits inſtituted academies at Raab and Caſchau.* A late traveller[7] informs us that the univerſity of Buda, by the Germans called Offen, poſſeſſes an income of about 20,000l. ſterling, only 4000 of which are applied to pay the ſalaries of the profeſſors. "Beſides the uſual chairs which exiſt in every univerſity, there are thoſe of natural hiſtory, botany, and œconomy. The collection of inſtruments for natural philoſophy, and the models of machines, are good; and the muſeum of natural hiſtory, which contains the collection of the late profeſſor Piller, beſides that of the univerſity, may be ranked among the fine collections of Europe." There is a Calviniſt college or univerſity at Debretzin: and the biſhop of Erlau has recently eſtabliſhed a ſplendid univerſity at that city.[8] Univerſities.

Vienna, the chief city of the Auſtrian dominions, lies on the S. or rather W. ſide of the Danube, in a fertile plain watered by a branch of that river, (beyond which ſtands the ſuburb of Leopold-ſtadt,) and by Cities. Vienna.

[6] Dufreſnoy, Methode Geog. iii. 271.

* The univerſity of Tyrnau has been recently transferred to Peſth. Townſon, p. 439.

[7] Townſon, p. 79. [8] Ib. 225. 238.

Cities and Towns.

the little river Wien. The Danube is here very wide, and contains several woody isles: the country towards the N. and E. level, but on the S. and W. hilly, and variegated with trees. It is founded on the site of the ancient Vindobona; but was of little note till the twelfth century, when it became the residence of the dukes of Austria, and was fortified in the manner of that age. The manufactures are not inconsiderable; some inland commerce is transacted on the noble stream of the Danube.* The number of inhabitants is computed at 254,000. The suburbs are far more extensive than the city, standing at a considerable distance from the walls. The houses are generally of brick covered with stucco, in a more durable manner than commonly practised in England; the finest sand being chosen, and the lime, after having been slacked, remaining for a twelvemonth, covered with sand and boards, before it be applied to the intended use. The chief edifices are the metropolitan church of St. Stephen, the imperial palace, library, and arsenal, the house of assembly for the states of Lower Austria, the council-house, the university, and some monasteries. The prater, or imperial park, is an island in the Danube well planted with wood; and to the S. is the chapel of Herenhartz, which during Lent is much frequented for the sake of amusement, as well as of devotion. Provisions of all kinds abound in Vienna, particularly wild boars, venison, and game; many small birds, rejected by us, being included among the latter. Livers of geese are esteemed a peculiar delicacy; nor are tortoises, frogs, and snails rejected.† The people delight in the combats of wild beasts, and of bulls. In one of the suburbs is the palace of Belvidere, which formerly belonged to prince Eugene; and at the distance of a few miles stands Schonbrun, another imperial palace. Though Vienna be much exposed to the northern and eastern

* The manufactures are on the increase, particularly those of cotton. See Hoeck, who says, there are 140,000 workmen at Vienna, and some towns in Lower Austria.

† Riesbeck, himself a German, blames the Austrians, i. 237, for gluttony, and a certain indescribable coarse pride. Yet he highly praises the schools, p. 280. The richest subject by his account was Prince Lichtenstein, who had about 90,000l. sterling a year, while Esterhazy only enjoyed 60,000.

winds,

winds, yet the ſouthern hills ſerve as a fence againſt the rain, and the traveller rather complains of duſt than of moiſture. The pleaſantneſs of the environs in general is improved by the happy aſpect of the Auſtrian peaſantry. Cities and Towns.

The honour of the ſecond city in the Auſtrian dominions muſt be claimed by Prague, the population being eſtimated at 80,000. This metropolis of Bohemia ſtands on both ſides of the river Mulda, over which there is a noble bridge of ſtone, founded in 1357. The fortifications are of ſmall moment; but the houſes are of ſtone, and commonly three ſtories in height. This city has had the fatality of being expoſed to frequent ſieges, commonly fortunate to the aggreſſors. About a ſixth part of the population conſiſts of Jews. Prague.

Next, though at a great diſtance, ſtands Gratz, the capital of Stiria, ſuppoſed to hold 35,000 ſouls. This city ſtands on the W. ſide of the river Muehr, joined by a bridge to an extenſive ſuburb on the oppoſite bank. There are regular fortifications; and on a bold rock near the river is placed a ſtrong citadel. Gratz.

Preſburg, the capital of Hungary, only contains about 27,000 inhabitants, its precedence being of modern date, after Buda, the ancient capital had been repeatedly taken by the Turks.* Preſburg is beautifully ſituated on the Danube, towards the weſtern extremity of Hungary, being only about 35 Britiſh miles to the E. of Vienna; but the poſition is ſtill more uncentrical than that of Buda. The Danube is here very rapid, and about 250 yards in breadth. About one quarter of the inhabitants are Lutherans, who are ſo opulent as to pay about one half the taxes. A good theatre, and convenient coffee-houſes, contribute to the pleaſure of the inhabitants. Jews alſo abound in this city. Preſburg.

Buda, by the Germans called Offen, the ancient metropolis of Hungary, is now reduced to little more than 20,000 inhabitants; but if the city of Peſth be included, which ſtands on the oppoſite Buda, or Offen.

* Townſon, 440. *Alba Regalis*, formerly celebrated, is now Stuel Weiſſenburg, 34 Br. miles S. W. of Buda. *Alba Græca*, or Griechs Weiſſenburg, is Belgrade.

Cities and Towns.

ſide of the Danube, over which there is a bridge of boats, the population may be computed at 34,000. Dr. Townſon even allows 38,000. The chief public and private buildings are in Peſth, and within the fortreſs: the royal palace in particular, is a large and ſtately edifice. At Buda there are hot ſprings; and the people, like thoſe of Vienna, delight in bull feaſts and exhibitions of wild beaſts. In 1784 the ſeat of the provincial government, and the public offices being reſtored from Preſburg to Buda, the latter joined with Peſth may ſtill be regarded as the capital of Hungary.[9] The mining cities of Schemnitz and Cremnitz do not exceed 8000 inhabitants each:* but Hermanſtadt, the capital of Tranſylvania, in Latin *Cibinium*, from the river Cibin, is ſuppoſed to contain 17,000. It is the chief ſeat of the Saxon colony; but the air is unhealthy. The Buckovina, annexed to the Auſtrian territory in 1777, contains no town of conſequence.

Hermanſtadt.

That part of Poland which was acquired in 1772, and divided into two provinces, called Galitzia and Lodomiria, preſents Lemberg, or Leopold, of 20,000 inhabitants, and ſome other conſiderable towns. Among the Poliſh acquiſitions muſt alſo be named Cracow, anciently the capital of that kingdom, and eſtimated to contain 24,000 people. This city ſtands on the Viſtula and has a caſtle, but is poorly fortified.

Cracow.

Brunn, in Moravia, is computed at 18,000; and Olmutz, in the ſame country, at 12,000; and the latter number is alſo aſſigned to Troppau, in the Auſtrian part of Sileſia. In the ſouthern provinces, Inſpruck and Trent are ſuppoſed each to contain 10,000 ſouls. Trieſte, which is reckoned at 18,000, deſerves more particular attention, having been for a long time the only ſea-port belonging to Auſtria. It is ſituated on a gulph of the Adriatic and riſes on an aſcent which is crowned by a caſtle. The ſhipping is ſecured by a wall, extending from the Lazaretto to the iſle of Zuka; and the harbour was declared free by the empreſs Thereſa. The neighbourhood produces excellent wines.

Trieſte.

[9] Townſon, p. 90.

* Hoeck puts Cremnitz at 4000.

The

The chief public edifices are at Vienna, Buda, and Peſth, but there are many ſplendid churches and monaſteries in the ſeveral regions of the Auſtrian domination. Many of the Hungarian nobility, who have vaſt eſtates, poſſeſs caſtles of correſponding magnificence. Among theſe the chief are the Paleſy, Schaki, Erdoby, Sichy, Forgatſh, Kohari, Karoly; but above all Eſterhazy, whoſe caſtle, about a day's journey from Preſburg, is ſaid to rival Verſailles in pomp; and ſeems alſo to rival that palace in the ſurrounding deſolation, being in a moraſſy country near the Neuſidler lake.[10] Edifices.

The utility of inland navigation ſeems to be little perceived in the Auſtrian dominions; and even the noble canals in the Auſtrian Flanders have ſuffered by ſtrange neglect. The long navigable courſe of the Danube may, in ſome meaſure, apologize for this deficiency; but there is no doubt that the greateſt advantages might be derived by opening canals in ſome of the provinces, particularly towards the Adriatic, and in Hungary. Inland Navigation.

Nor do manufactures ſeem to be cultivated to a great extent in any part of the Auſtrian dominions. Vienna perhaps equals any other of the cities in manufactures, which are chiefly of ſilk, gold and ſilver lace, cloths, ſtuffs, ſtockings, linen, mirrors, porcelain; with ſilver plate, and ſeveral articles in braſs.[11] Bohemia is celebrated for beautiful glaſs and paper. But the commerce of the Auſtrian dominions chiefly depends upon their native opulence; Auſtria Proper and the ſouthern provinces producing abundance of horſes and cattle, corn, flax, ſaffron, and various wines, with ſeveral metals, particularly quickſilver from the mines of Idria. Bohemia and Moravia are alſo rich in oxen and ſheep, corn, flax, and hemp; in which they are rivalled by the diſmembered provinces of Poland. The wide and marſhy plains of Hungary often preſent excellent paſturage for numerous herds of cattle; and the more favoured parts of that country produce corn, rice, the rich wines of Tokay, and tobacco of an exquiſite flavour, with great and celebrated mines of various metals and minerals. The Auſtrian Manufactures and Commerce.

[10] Rieſbeck, ii. 49. 66.

[11] Buſching, vi. 549. See Hoeck.

territories

MANUFACTURES AND COMMERCE.

territories in general are so abundant in the various necessaries and luxuries of life, to be found either in the N. or S. of Europe, that the imports would seem to be few and inconsiderable. The chief exports are from the port of Trieste, consisting of quicksilver and other metals, with wines and other native products. Dr. Townson[12] gives a table of the exports of Hungary for one year, from which it appears that they consisted chiefly of cattle, hogs, sheep, flour, wheat, rye, wool, and wine, carried to other Austrian provinces; and only about one seventh part sent to foreign countries.

[12] P. 198. Hoeck says, that in the archduchy of Austria there are seven great manufactures of cotton cloth, which occupy 140,000 individuals; and at Lintz a woollen manufactory employs 30,000. The iron manufactures are numerous in Stiria. Bohemia has linen manufactures to the annual amount of 16,000,000 of florins, with some in wool, and cotton. For the others that author may be consulted.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of Austria Proper is commonly mild and salubrious, though sometimes exposed to violent winds, and the southern provinces in general enjoy a delightful temperature, if the mountainous parts be excepted, exposed to the severities of Alpine winter. The more northern regions of Bohemia and Moravia, with the late acquisitions in Poland, can likewise boast the maturity of the grape, and of gentle and favourable weather. The numerous lakes and morasses of Hungary, and the prodigious plains resembling deserts, are supposed to render the air damp and unwholesome, the cold of the night rivalling the heat of the day; but the keen blasts from the Carpathian mountains seem in some measure to remedy these evils, the inhabitants being rather remarkable for health and vigour.

Face of the Country.

The appearance of the various regions subject to Austria is rather mountainous than level, presenting a striking contrast in this respect to those of Russia and Prussia. Commencing at Bregentz on the lake of Constance, we find chains of mountains, and the Rhætian alps, and glaciers of Tyrol, branching out on the S. and N. of Carinthia and Carniola. Another chain pervades Dalmatia, and on ascending towards the N. Stiria displays chains of considerable elevation. The southern limit of Austria Proper is marked by other heights; and Bohemia and Moravia are almost encircled by various mountains, which on the E. join the vast Carpathian chain, which winds along the N. and E. of Hungary and Transylvania, divided from each other by another elevated ridge:

Face of the Country.

ridge: the dismembered provinces of Poland, though they partake in the S. of the Carpathian heights, must yet afford the widest plains to be found within the limits of Austrian power.

This ample extent of country is also diversified by many noble rivers, particularly the majestic Danube, and its tributary stream the Tiess, which flows through the centre of Hungary; and scarcely is there a district which is not duly irrigated. The general face of the Austrian dominions may therefore be pronounced to be highly variegated and interesting; and the vegetable products of both the N. and S. of Europe unite to please the eye of the traveller.

Soil and Agriculture.

The soil is upon the whole extremely fertile and productive, in spite of the neglect of industry, which has permitted many parts of Hungary, and of the Polish provinces, to pass into wide forests and marshes. Were skill and labour to assume the axe and spade, those very parts might display the greatest exuberance of fertility. Travellers seldom attend to the important topic of national agriculture; and therefore intelligence somewhat antiquated must be adopted. About the year 1770 an observer[1] found that Bohemia had suffered considerably by the ravages of war; the wheat was however tolerable, but the barley full of weeds, and exposed by negligence to the inroads of the cattle, who are fed in winter with the cabbage-turnip, and red cabbage, both cultivated in large quantities. The flax seemed particularly to flourish; but the industry of the citizens, farmers, and peasants, was crushed by the overweening pride of the nobility, and the state of the peasantry was little superior to that of Poland. In the warm spots of Bohemia hops were cultivated, which with the barley formed excellent beer, a chief export of the country. In Moravia the agriculture seemed rather superior, being improved by Flemish farmers. That of Austria was laudable, except that enclosures were wanting. The greater part of Hungary he regarded as a fertile pasturage for sheep; and Flemish manufacturers were employed to improve the wool. Oats were little cultivated in Austria Proper; the other products as usual in England, par-

[1] Marshall's Travels, iii. 304. These Travels are said to have been written by Sir John Hill. I know not if the knight of the polar star travelled in the north or east, but he must have used good materials.

ticularly abundance of cabbages and potatoes; but the cultivation was not neat, ſmall waſte ſpots being left by the plough, which harboured weeds, to the great detriment of the field. The vineyards and fields of ſaffron were numerous, cattle appeared in abundance; and large herds of ſwine, the latter feeding all the ſummer in the woods. At a more recent period, Mr. Coxe[2] gives a deplorable picture of the want of cultivation in the ſouthern provinces of Poland, now ſubject to Auſtria, the country being generally overſpread with vaſt tracts of thick gloomy foreſts, and even from Cracow to Warſaw, a courſe of about 258 Engliſh miles, he only met with two carriages, and about a dozen carts. The country was generally ſandy or marſhy, and quite devoid of marks of induſtry: the peaſantry were the moſt miſerable and abject that he had ever ſeen, and would aſſemble in crowds to implore charity. Such being the caſe, Auſtria cannot have made any great acquiſition in her Poliſh provinces; and Pruſſia has in fact the chief reaſon to boaſt of the partition. Soil and Agriculture.

In enumerating the chief rivers which pervade the Auſtrian dominions, the Danube commands the firſt attention. This magnificent ſtream riſes in Swabia; and count Marſigli has delineated and explained its humble fountains, in his large and curious work on this river. Though the courſe be occaſionally impeded by ſmall falls and whirlpools, yet it is navigable through a prodigious extent, and after watering Swabia, Bavaria, Auſtria Proper, Hungary, and Turkey in Europe, it joins the Euxine, or Black Sea, after a comparative circuit of about 1300 Britiſh miles, about one half of its progreſs being through the territories of Auſtria. Rivers. Danube.

Next in conſequence is the Tieſs, which ariſing from the Carpathian mountains, towards Buckovina, and bending towards the weſt, receives many tributary ſtreams from that Alpine chain; and afterwards turning to the S. falls into the Danube not far to the W. of Belgrade, after a courſe of about 420 miles. At Belgrade the Danube receives the Sau, or Save, which forms a boundary between Auſtria and Turkey, riſing not far from Idria in the mountains of Carniola, and purſuing a courſe nearly equal in length to that of the Tieſs. That of the Drau or Drave Tieſs.

[2] Vol. i. 162, and p. 201.

Rivers. extends to about 350 miles, from its ſource in the eaſtern mountains of Tyrol, till it join the Danube below Eſſeg.

The Inn riſes in the E. of Swiſſerland, from the mountain of Maloggia in the Griſons, being a point of partition dividing the waters which run towards the Black ſea, from thoſe which flow into the Adriatic.[1] This powerful river is more gentle near its ſource, than the other Alpine ſtreams, but ſoon becomes more precipitous; and joins the Danube at Paſſau with a weight of water nearly equal to that ſtream, after a courſe of about 250 miles, being nearly equal to that of the Danube itſelf at their junction.

The Raab, and the Leytha, intermediate ſtreams between the Drave and the Inn, only deſerve a brief mention. The Mulda is a conſiderable river which riſes in the ſouthern mountains of Bohemia, and after running about 50 miles S. E. bends due N. and joins the Elbe near Melnick, after paſſing through Prague. The Elbe itſelf ariſes in the Sudetic mountains between Bohemia and Sileſia, and waters a great part of the former kingdom before it enters Saxony, bending its courſe N. W. towards the German ocean. The Morau, whence Moravia derives its name, alſo ariſes in the Sudetic mountains; and paſſing by Olmutz joins the Danube not far to the W. of Preſburg.

Mulda. Elbe. Morau.

Lakes. The lakes in the Auſtrian dominions are numerous, and ſome of them of conſiderable ſize. Bohemia preſents a few ſmall pieces of water, towards its ſouthern boundary; but on entering Auſtria Proper, the lake of Traun, the Ebernſee, and others, are of greater extent. Carinthia contains a large central lake not far from Clagenfurt; and Carniola another, the Cirknitz See. Tyrol, though an Alpine country, diſplays no lake of any conſequence, except a part of the Lago di Garda; but the glaciers are numerous. Hungary contains many moraſſes and lakes; the moſt important of the latter being that of Platte, or the Platten See extending about forty-five Britiſh miles in length, by eight in breadth, and abounding with fiſh. The Neuſidler lake, about thirty miles S. E. of Vienna, is about thirteen miles in length by four in breadth. It is almoſt ſurrounded by fens; and is chiefly remarkable for being in the vicinity of Eiſenſtadt, the princely

[1] Coxe's Swiſſ. iii. 28.

residence

residence of the family of Esterhazy. On the E. of the Tiess is the lake of Palitzer, about eight miles in length. In Transylvania is the Tsege To; and many small lakes are situated amidst the Carpathian mountains. Lakes.

In considering the various elevated chains which diversify the Austrian territories, the description shall begin with the western extremities, and terminate with the eastern. In this point of view the Rhætian or Tyrolese Alps will claim the first attention. These chiefly proceed in a direction from the S. W. to the N. W., or from the Valteline to the archbishoprick of Salzburg. This Saussure has observed is the general course of the Alpine chains.[4] The Brenner mountains, for such is the modern name of the Rhætian Alps, rival the grand Alps of Swisserland in numerous glaciers; and like other grand chains present exterior barriers, that on the N. being distinguished by the name of Spitz, while that on the S. is termed Vedretta.[5] On leaving Italy there is almost a gradual ascent, from Trent to the highest summit. The primitive or greatest elevations arise to the N. of Sterzing, whence streams proceed towards the river Inn on the N. and the Adige on the S., and the Eisac descends, a precipitous torrent, amidst masses of granite, petrosilex, and marble, while the avalanches become dangerous to travellers. "The naked and rugged peaks of the mounts Lorenzen, Fartschel, and Tschafatsch, raise their towering heads towards the N. W., and on the S. E. are those of Glander, Schloss, Pragls, and Pallanser. Their summits are entirely bare; and seem to be composed of granite." The glacier most easy of access is that of Stuben, the centre of which presents many Alpine plants; and the granite and porphyry are frequently covered with calcareous stone. The glacier of Stuben is 4,692 feet above the level of the sea, and presents the usual phænomena of such scenes, with beautiful pyramids of azure, which in sunshine reflect a blaze of light. The mountain specially called Brenner is, according to Beaumont, only 5,109 feet above the sea. The town of Steinach is placed nearly in the centre of the Tyrolese chain: towards the E. from the midst of a long course of glaciers running N. E. and S. W. rises the grand mountain Gefrorn, a mass of granite covered

Mountains.

Rhætian Alps.

[4] Vol. viii. 241.

[5] Beaumont's Rhæt. Alps, London, 1792, fol. p. 37, &c.

Mountains.

covered with eternal ſnow, and one of the higheſt peaks of the Rhætian Alps: on the weſt is Habichſpiz, of ſmaller height; but to the S. W. is Tributaau, another ſtupendous peak of the great Brenner chain. The Bock-kogo is another vaſt peak, riſing little inferior to Gefrorn, and in the ſame latitude, but towards the weſt.[6]

Towards the W. and N. of Inſpruck are ſeveral detached mountains, covered with conſtant ſnow; among which thoſe of Verner* are the moſt remarkable. Near the glaciers are found rock cryſtals of various colours, vulgarly called rubies, emeralds, &c. and the inferior ranges of the Tyroleſe mountains contain mines of ſilver, copper, lead, mercury, iron, alum, and ſulphur. In the vale of Zill is a mine of gold, which barely defrays the expence and labour. Towards the S. the mountains are rich in wood and paſturage; but the northern hills are bleak and barren. The inferior mountains are, as uſual, calcareous, or argillaceous; but thoſe of Verner are granitic. The Tyroleſe Alps being ſeldom viſited by travellers, it was judged proper to give rather an ample deſcription.

Italian. Carnic.

The provinces of Carinthia and Carniola preſent many conſiderable chains of mountains; as that of Lobel which ſeparates theſe countries; and the Julian, or Carnic Alps, (now called Birnbaumer Wald,) which divide Carinthia from Italy. Carniola is chiefly mountainous, and many of the ſummits are covered with laſting ſnow; the moſt memorable are the Kalenberg near the river Save, and the Runberg, and the Karſt to the S. of Idria. Here alſo terminates the vaſt chain, which proceeds by the N. of Dalmatia towards the Hæmus, and is known by many local appellations, as Mount Promina near Gnin, Mount Prologh, Mount Clobu, &c. &c. but better diſtinguiſhed by the title of the Dalmatian chain. The latter mountains are chiefly calcareous.[7]

Returning towards the N. firſt occurs the chain of Bacher, in the S. of Stiria; mount Graſan on the E. of Judenburg; and the chief mountains in this province, thoſe of Grimin, in its weſtern extremity

[6] Beaumont's Rhæt. Alps, 59. The Brenner, or burning hill, is ſo called on account of the frequent thunder ſtorms. Ib. 65. The Glockner and Ortel are computed at 11,500 feet. In the archbiſhopric of Salzburg the Hoch-horn at 10,663. Monthly Mag. ix. 539.

* Buſching, vii. 84. ſays *Ferner* is merely a Tyroleſe term for a glacier.

[7] Fortis's Dalmatia.

towards Salzburg. On the E. towards Hungary this country is more plain and fertile. MOUNTAINS.

On the S. of Auſtria is a chain of inconſiderable elevation. Buſching ſuppoſes that the ancient Cetius is a ridge extending from near the ſource of the river Save, towards the Danube, about nine Britiſh miles on the W. of Vienna, where it is called Leopoldſberg.[1] The general name is the Kalenberg; but parts of it go under particular denominations, as Caumberg, Annaberg, Sauruſſel, Teufelſtaig, Golach, Schneeberg, Semmering, &c. and it is certain that the Cetian chain of Ptolemy runs in that direction.* However this be, Upper Auſtria, or the weſtern part of this province, contains many conſiderable mountains, the higheſt of which is in the maps called Priel, but the proper name is Greſſenberg. Towards the N. Auſtria is divided from Bohemia by a ridge of conſiderable elevation, which paſſes to the N. E. of Bavaria. On the N. W. Bohemia is parted from Saxony by a chain of metallic mountains, called the Erzgeberg, a word that implies hills containing mines. On the W. of the river Eger, near its junction with the Elbe, ſtands the mountainous group of Mileſſou ſuppoſed to be the higheſt in the province.† On the N. E. the Sudetic chain, which branches from the Carpathian, divides Bohemia and Moravia from Sileſia and the Pruſſian dominions. Auſtrian.

The Carpathian mountains, that grand and extenſive chain which bounds Hungary on the N. and E., have been celebrated from all antiquity. By the Germans they are ſtyled the mountains of Krapak, probably the original name, which was ſoftened by the Roman enunciation: the Hungarians, a modern people, call them Tatra. This enormous ridge extends in a ſemicircular form from the mountain of Carpathian Mountains.

[1] Buſching, vi. 527-8. The ridge of Kalenberg was the weſtern boundary of Germany till about A.D. 1040, when it was removed E. to the river Leitha. Putter, i. 155. Caſſini in his Voyage en Allemagne, p. xxiii. obſerves, that the mountains of Kalemberg, on the weſt of Vienna, are well known by the route of the Bavarians who marched to defend that capital againſt the Turks.

* The Semmering heights divide Auſtria from Stiria; and a noble road was formed over them in 1728. The Lobel, between Carinthia and Carniola, is paſſed by a ſingular excavation through a ſummit. Brown, 125.

† Buſching, vi. 126. The Donnerberg, near Mileſſou, is regarded as the higheſt mountain in Bohemia. The ſummit of the Rieſengeberg is free from ſnow in ſummer, and probably not above 6000 feet high. See Rieſbeck, ii. 149.

Javornik

MOUNTAINS.

Javornik S. of Silesia towards the N. W. But at the mountain of Trojaſka, the moſt northern ſummit, it bends to the S. E. to the confines of the Buckovina, where it ſends forth two branches, one to the E. another to the W. of Tranſylvania; which is alſo divided from Walachia by a branch running S. W. and N. E. The whole circuit may be about 500 miles. Dr. Townſon viſited theſe Hungarian Alps from the vicinity of Keſmark, firſt proceeding to the Green See, a lake amidſt the mountains, paſſing through foreſts of firs, which were ſucceeded by rocks of limeſtone and granite. The Krumholz, a kind of tree reſembling the pine, but feathered with thick branches to the very ground, ſomewhat impeded the progreſs. He computes that the Keſmark peak, which towards Hungary is a perpendicular rock, may be about 8508 feet above the level of the ſea. He afterwards proceeded to the Lomnitz peak, which he ſays is the higheſt of the whole Carpathian chain, and placed towards its centre: yet he afterwards expreſſes ſome doubt whether it be not rivalled, if not exceeded, by the Krivan, ſituated more towards the W. 20° 45′ of E. longitude from London.[9] The ſummit of Lomnitz he attained with ſome difficulty, and computed it to be 8640 feet above the level of the ſea, not much above half the height of M. Blanc, or M. Roſa. He found it compoſed of grey granite like the rocks at the bottom; but with a ſmall mixture of a greeniſh black, earthy ſubſtance; yet the vegetation conſiſted of little except a f[illegible]chens. Thoſe peaks are ſeldom viſited except by the hunters of the chamois, and ſome idle adventurers, who ſearch for gold and precious ſtones. The marmot alſo appeared; but our intelligent author denies that the ibex, or rock goat of the Swiſs Alps, is found in the Carpathian heights. The Krivan he afterwards aſcended with more eaſe, but found it inferior in height to the Lomnitz, being 8343 feet above the ſea. It is probable that ſummits of greater elevation ariſe in the eaſtern part of the chain; but there are no glaciers nor other tokens of the eternal winter of great altitude.

The Carpathian ridge occaſionally branches towards the N. and S.; in the former direction the moſt remarkable are the hills on the W. of

[9] Townſon, 352. 363.

Sileſia,

Silesia, those which adjoin to the salt mines of Wieliczka a few miles S. F. from Cracow in Poland, and those which extend through part of the Buckovina Towards the S. a branch stretches from the centre of the chain towards Tokay; and there are other branches not accurately defined, which descend in the same direction from the eastern circuit. Among the detached mountains of Hungary may be named those of Matra in the centre of the kingdom, about 50 miles N. E. of Buda: those of Fatra N. E. of Cremnitz: of Avas in the district of Marmaros: Farkas to the S. of Nemethi. The mountains of Transylvania are numerous, besides the two branches of the Carpathian chain, which may be regarded as enclosing the country. The Bannat of Temeswar also presents many ridges of considerable height. Mountains.

To enumerate the forests in the Austrian dominions would be a task at once laborious and fruitless. Suffice it to observe that numerous and extensive forests arise in every direction, particularly along the Carpathian mountains, and in the provinces acquired from Poland. Even Bohemia was formerly remarkable for a forest of great extent, a remain of the Hercynia Sylva of antiquity, which extended from the Rhine to Sarmatia, from Cologne to Poland. The Gabreta Sylva was on the S. W. of the same country, where a chain of hills now divides it from Bavaria. Forests.

The states which compose the powerful and extensive empire of Austria have been surveyed with very different degrees of accuracy as to their natural productions. While the botany of Austria Proper has been carefully illustrated by Jaquin;* and that of Carniola by Scopoli † and Hacquet;‡ the flora of Hungary is still very imperfect; and the late acquisitions in Poland by the last and former partitions are as yet in a manner unknown to natural history. The general mild temperature of the Austrian states, their variety of soil and situation, from the lakes and rich levels of Hungary, to the snowy summits of Istria and Carinthia, are a sufficient evidence of the richness of their flora; each year it is augmented by the discovery of new species, and will doubtless long continue to be increased by the investigations of future botanists. We shall follow the plan to which we have hitherto ad- Botany.

* Flora Austriaca. † Flora Carniolica. ‡ Plantæ Alpinæ Carniolicæ.

hered

Botany. hered of enumerating, as far as our narrow limits will allow, the principal vegetables, natives of Auſtria, which for their beauty or uſe merit particular notice; of theſe it will be found that a large proportion have been admitted into our gardens, and many more, from the elegance of their form, or glow of colour, have an equal claim to domeſtication.

Of the natural order of the *Enſatæ*, diſtinguiſhed by their compreſſed ſharp ſword-ſhaped leaves, ſeveral ſpecies are found wild in the Auſtrian dominions, among which may be diſtinguiſhed five ſpecies of iris, the *corn-flag*; and *branched ſpiderwort*; all of which have been naturalized in our gardens.

The bulbous-rooted plants of the order Hexandria of Linnæus, remarkable, for the moſt part, for the beauty of their flowers, and abounding moſt in the warmer climates, occupy a conſpicuous rank in the flora of Auſtria: a long liſt of theſe might be produced, but we ſhall ſelect only the principal: theſe are the *tufted* and *cluſtered hyacinth*; the *ſpring*, *ſummer*, and *autumn ſnowflake*; allium victoriale, one of the moſt ſtately and ornamental ſpecies of the large genus *garlic*; *orange lily*; *martagon lily*; *turncap lily*; *dog's tooth violet*, one of the earlieſt beauties of the ſpring; *chequered daffodil*; *branched aſphodel*; *yellow* and *tawny day-lily*; and laſtly, though perhaps ſuperior in beauty to any of the preceding, *white* and *black hellebore*.

For the claſs ſyngeneſia, or the compound flowered, though it contain many ſpecies that are natives of Auſtria, yet as theſe are for the moſt part plants of little uſe, and as little remarkable for their beauty, a ſhort notice will ſuffice: the moſt intereſting of theſe to the general reader are arnica montana, uſed in medicine; carduus mollis and canus, *ſoft* and *hoary thiſtle*; *purple ſcorzonera*; ſenecio abrotanifolius, *ſouthern-wood-leaved ragwort*, with ſomewhat hoary finely divided leaves and large bright yellow bloſſoms; artemiſia Auſtriaca, *Auſtrian ſouthernwood*; and xeranthemum annuum, a pretty plant, an inmate of our gardens whoſe radiated purple and white flowers, if gathered when fully blown and kept in a dry place, will retain their beauty the whole winter through.

Of the ſedums and their kindred genera it will be ſufficient to mention two ſpecies of ſingular beauty, the ſempervivum hirtum, *hairy*

hairy orpine; and ſ. moritanum; of theſe the latter is by far the moſt elegant plant of its tribe. BOTANY.

To the claſs decandria belong ſeveral intereſting plants, of which the following are moſt worthy of mention; *alpine* and *maiden pink*; *fraxinella*; and three ſpecies of rhododendron, the hirſutum, chamæciſtus and ferrugineum, all of which merit diſtinction in a genus, every ſpecies of which is more than commonly beautiful.

The umbelliferous plants of Auſtria, as well as thoſe of every other European country, are very numerous; the following are the larger ſpecies and the moſt characteriſtic, Selinum Auſtriacum; Heracleum Auſtriacum; Peucedanum Alſaticum; Liguſticum Auſtriacum; and L. Peloponneſiacum.

The Linnæan claſs pentandria contains the moſt beautiful of the indigenous plants of the Auſtrian dominions, ſeveral of which have found their way into our gardens. The moiſt and ſpungy ſides of the mountains from the Carpathian chain to the heights of Iſtria are adorned by the ſoldanella alpina and aretia alpina, two minute but exquiſitely beautiful plants, the former with purple, the latter with white and fleſh coloured bloſſoms. Among the numerous ſpecies of flax, the following very elegant ones are natives of Auſtria: *hairy flax*; *yellow flowered f.*; *Auſtrian f.*, with large deep-blue bloſſoms. The reſt of this claſs that require notice are, cerinthe major, *greater honeywort*; verbaſcum phœniceum, *purple mullein*; gentiana acaulis, *ſtemleſs gentian*, diſtinguiſhed by its large erect blue bell-ſhaped bloſſom, riſing immediately from the centre of the leaves; gentiana Pannonica, the moſt ſplendid of the whole genus, growing to a conſiderable height, and bearing its large purple-dotted bloſſoms in tufts on the top and ſides of the ſtem: the Auſtrian flora is alſo graced by ſeveral ſpecies of primula; by the cyclamen europæum; campanula thyrſoidea, remarkable for its pale yellow bloſſoms; phyſalis alkekengi, *winter cherry*; and aſclepias vincetoxicum, *ſwallow-wort*.

Of the papilionaceous plants may be enumerated the *greater laburnum*, a tree of ſome magnitude, adorning the banks of the Danube with its long cluſters of golden bloſſoms; and coronilla coronata, diſtinguiſhed by its glaucous leaves, and its bright yellow bloſſoms.

Botany. Several remarkable plants, inhabitants of the Auſtrian dominions, arrange themſelves under the Linnæan claſs polyandria; among theſe may be diſtinguiſhed two ſpecies of Adonis or *pheaſant's eye*, the a. miniata and flammea, adorning the fallows with their ſcarlet petals; *alpine poppy*, remarkable by its ſnow-white flowers; *mountain* and *narciſſus-leaved anemone; bears-foot hellebore; Chriſtmas roſe;* and *winter aconite; white flowered mountain ranunculus;* potentilla nitida, conſpicuous for its beautiful fleſh-coloured petals, and its glaucous leaves: atragene alpina, adopted into our flower-gardens; and four ſpecies of aconite or monkſhood, of which the A. cammarum is the largeſt and moſt ſhowy of the whole genus; the ſacred *lotus* of Egypt and India, has alſo of late been found in ſome lakes in Hungary.

The perennial ſhrubby plants may be divided into the flowering ſhrubs, the fruit-bearing, and the foreſt trees. Of the former claſs ſome, as the laburnum, have been already mentioned, the reſt with the exception of erica carnea, *fleſh-coloured heath;* ſyringa vulgaris, *lilac*; and tamarix Germanica, *German tamariſk*, are ſcarcely intereſting, except to botaniſts. The common fruit-trees of Europe are largely cultivated in the provinces of Auſtria, but their liſt of native fruits is very ſcanty. The foreſt trees, beſides thoſe which are common to all Europe, are loranthus europæus; quercus cerris, *prickly-cupped oak; ſumach; walnut; cheſtnut; hornbeam*, and carpinus oſtrya.

Zoology. The domeſtic animals in the Auſtrian dominions are commonly excellent, particularly the cattle. According to a late traveller [10] the Hungarian horſes have been erroneouſly eſtimated from the ſpirited cavalry ſupplied by other regions, while the native breed is very ſmall, and the ſtallions and brood mares are foreign. Many of the native horſes run wild, and are ſold in great numbers at the fairs, before they have ſuffered any ſubjection. The breed of cattle is moſtly of a ſingular colour, a ſlaty blue; and the Hungarian ſheep reſemble the Walachian in their long erect ſpiral horns, and pendent hairy fleece. In the weſtern parts of the Auſtrian ſovereignty, the animals do not ſeem to be diſtinguiſhed from thoſe of other parts of Germany.

[10] Townſon, 230.

The

The large breed of wild cattle, called Urus or Bifon, is faid to be found in the Carpathian forefts, as well as in thofe of Lithuania and Caucafus. Among the ferocious or wild quadrupeds, may alfo be named the bear, the boar, the wolf, the chamois, the marmot, and the beaver. Among the larger birds, the buftard and pelican are fome of the moft uncommon; and Carniola produces the ftrix fylveftris, the tetrao nemefianus, the fturnus collaris, the emberiza barbata and brumalis, the motacilla of three uncommon kinds, the hirundo rupeftris, the ardea alba, the mergus æthiops, three kinds of the larus, and the anas fubterranea.[11] Even Auftria claims fome birds rather peculiar, as four uncommon kinds of the falcon, the ftrix fabaurita, the motacilla dumetorum, the parus pendulinus, the pratincola krameria, and perhaps others. The Danube alfo boafts of fome fifhes feldom found in other rivers, among which is a fmall and delicate fort of falmon. To enumerate uncommon infects would be too minute a labour for the defign of the prefent work; but for thofe of Hungary the travels of Dr. Townfon may be confulted. Zoology.

The mineralogy of the Auftrian dominions being by far the moft various and interefting of any in Europe, it will be proper to confider it with fome attention. There is fcarcely a province of this extenfive territory, from the frontiers of Swifferland to thofe of Turkey, which cannot boaft of advantages in the mineral kingdom; and as it were by a deftiny attached to the houfe of Auftria, even the acquifitions in Poland contain one of the moft remarkable mines in Europe, the faline excavations of Wielitfka. To begin on the N. W. and afterwards purfue the defcription towards the S. and E., the mines of Bohemia have been celebrated from ancient times.[12] Silver is found at Kuttenberg, and at Joachimfthal, on the weftern frontier towards Saxony, probably a continuation of the veins of that country: this mine was difcovered in 1516, and next year were ftruck from it the crowns of Joachim. Other places of this province alfo produce this precious metal: and gold has been difcovered at Keonftock. One of the moft fingular products of this province is tin, which is found at Zinwald (that is the tin foreft), alfo on the frontier of Saxony, near Krauppen, at Schlaken- Mineralogy.

[11] Pennant, Brit. Zool. ii. Appen.

[12] Bufching, vol. vi. 126. French edit. 8vo.

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wald or Slauka, a few miles to the N. of Carlſbad, and at Lauterbach and Schoenfeld in the ſame diſtrict; ſo that this metal is reſtricted to the weſtern part of Bohemia: where is alſo found, at Dreyhacken, a mine of very pure copper. Lead occurs at Bleyſtadt, or Pleyſtadt, in the ſame quarter; and Buſching reckons quickſilver among the products of Bohemia, along with iron, magnet, alum, ſulphur, vitriol, terra ſigillata, talc, and coal. But the precious ſtones which he mentions ſeem to be only coloured cryſtals. The garnets of Bohemia are however among the moſt beautiful of the kind. They are chiefly found in clay, mingled with mica, at Meronitz in the mountain of Stiefelberg, whence they are carried to Bilen.[13] There are other mines of garnets in the ſame region, on the weſt of the highway leading from Prague to Dreſden, where they are found with balls of baſalt formed of concentric layers, and ſome jacinths and chryſolites. The women waſh the clay in which the garnets are found; after which they are ſifted and arranged according to ſize; and ſold by the pound weight from about three to ten ſhillings. Many workmen are occupied in cutting and piercing them, for necklaces, and other ornaments: they are poliſhed in facettes, with emery on a piece of freeſtone, and pierced with a ſmall diamond. This branch of commerce is of great antiquity at Carlſbad, and at Walkirk in Swabia, where twenty-eight mills are occupied in this article only.

Nor is Moravia deſtitute of mineralogic advantages, producing not only iron in great abundance, but alum, ſulphur, and ſaltpetre. Gold was formerly found in the diſtrict of Znoyn or Znain: and ſilver was lately worked in that of Iglau, both on the confines of Auſtria.[14]

The fertile archduchy of Auſtria diſplays few minerals, though there be mines of gold near the abbey Goettwig, and of alum near Krems: ſaltpetre is however prepared in abundance; and at a little diſtance from St. Annaberg, near the frontiers of Stiria, a rich mine of ſilver was opened in 1754. The ſouthern provinces of Stiria, Carinthia, and Carniola, afford many important minerals. The iron of Stiria ſupplies the fineſt ſteel, and great quantities are imported into England: it is chiefly found at Eiſenerſt and Vorderberg; the former, in the diſtrict

[13] Journ. des Min. No. iv. 36.

[14] Buſching, vi. 420.

of

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of Enſthal, ſo called from the river Ens, were diſcovered in the year 1712; and the others are in the ſame quarter.[15] There are conſiderable lead mines near Pegau on the river Mohr, yielding about 5000 tons yearly; and at Zeyring were ſilver mines under water ſince the year 1158. Stiria alſo affords coal at different places; not to mention minerals of mere beauty or curioſity, among which may be named the ſingular blue granite, which is found at Kruglah, or Kriglach, about twenty miles to the E. of Bruck.[16]

On the E. of Stiria extends the duchy of Carinthia, alſo yielding excellent iron, the mines of Frieſach on the N. being particularly famous; as well as thoſe near the ſources of the Lyſer. In the neighbourhood of Villach, at Bleyberg, are found rich lead mines; and the ſame place ſupplies what is called fire-marble or lumachelli.

Carniola, or Krain, abounds with immenſe caves, and other natural curioſities: but except a few iron works, the mineralogy is little remarkable. On the weſt, towards the county of Gorz, which produces excellent wines, lies the Ban of Idria, a diſtrict immediately ſubject to the chamber of Inner Auſtria at Gratz. The quickſilver mines of Idria are celebrated in natural hiſtory, poetry, and romance. They were diſcovered in the year 1499; and the hill of Vogelberg has annually yielded more than 300,000 pounds weight of mercury. The common ore is cinnabar; but ſometimes the pure quickſilver runs through the crevices. Idria is ſurrounded with woody hills; and the Vogelberg on the E. produces oaks and broom, while the interior conſiſts of red clay, calcareous rock, and a black ſoft ſlate, which covers the metallic vein in a ſouthern direction. The deep deſcent is by ladders, and ſtairs of ſtone; and the length of the galleries is computed at 316 paces, or 1580 feet.[17] The operations in theſe vaſt mercurial caverns being pernicious to the health, are ſometimes allotted as a puniſhment to criminals.

[15] Ferber's Italy, p. 5.

[16] M. Jars, in his *Voyages Metallurgiques*, Paris 1774-1781, three volumes 4to. ſuppoſes I. 32, that the *flos ferri* of Stiria originates from the limeſtone, of which all the mountains around the mine are compoſed.

[17] Scopoli Tentamen de Minera Hydrargyri, Journal des Mines, No. xxxvi. Sargent's Mine, &c.

On

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On paſſing into Tyrol ſeveral mines occur of ancient reputation, ſuch as that of ſilver and lead near Lermos; and in the ſame quarter thoſe of Naſereit in the Verner mountains, about 30 miles N. W. of Inſpruck, which are opulent in ſilver, copper, lead, and iron.[15] Nor is the ſouthern region of Trent wholly deſtitute of mines. It may be proper to remark that ſome curious productions have been aſcribed to Tyrol, which really belong to the archbiſhopric of Salzburg, Zillerthal, in particular, being in the latter province.

But the principal mines in the Auſtrian dominions are ſituated in the eaſtern provinces of Hungary and Tranſylvania. About 40 miles to the S. of the Carpathian hills are the gold mines of Cremnitz; and 20 Engliſh miles further to the S. the ſilver mines of Shemnitz; cities which have ariſen ſolely from theſe labours, and thence called mining towns. Shemnitz is eſteemed the principal; and the ores are found in what Baron de Born ſtyles metallic rock.* The academy here inſtituted for the ſtudy of mineralogy is highly reſpectable, and only rivalled by that of Freyberg in Saxony. The mines of Cremnitz alſo produce ſome ſilver. Hungary contains mines of copper at Schmelnitz and Herrengrund, of antimony very rich at Roſenau; and in dif-

[15] Beaumont, 77. Ferber, 329. Tyrol is mentioned for the ſake of connection, being now ſubject to Bavaria.

* The Saxum metalliferum is, according to the account of Lefevre, who viſited theſe mines in 1788, (J. des Min. No. xii. p. 39—50.) a porphyry, of white felſpar and black mica in roſe coloured jaſper, too ſoft to be poliſhed. Mr. Eſmark, a diſciple of Werner, who viſited them in 1796, (Ib. No. xlvii), ſays the baſis is felſpar paſſing to hard clay, containing cryſtals of hornblende, black mica, and ſometimes of quartz. Mr. Kirwan deſcribes it as dark green, rarely reddiſh; but Dr. Townſon's account indicates grey with white ſpots, and he ſays that Baron de Born might have recogniſed it in that yellowiſh grey ſubſtance the uſual adjunct of opal.

The Baron de Born has himſelf ſettled the queſtion in his Travels in Hungary, or, according to the Engliſh tranſlation, in the Bannat. He ſays, p. 54, that the *ſaxum metalliferum* is by the miners called ſand-ſtone; and, p. 123, he ſays that "grey argillaceous rock, mixed with mica, ſchorl, or quartz grains, which I have preſumed to call *ſaxum metalliferum*." In p. 153. a white argillaceous compact ſtone is ſaid to reſemble *ſaxum metalliferum*: and p. 189. an argillaceous grey rock is pronounced to differ from this only by having ſpots of white lithomarga inſtead of mica. In his *Lithophylacium* he is equally explicit, (*Ind. Foſſil.* 154, 155): and Gmelin in his edition of Linnæus (Lyons, 1796, iii, 230), has thence juſtly deſcribed this curious rock, "*ex argilla quartzi cryſtallis, et aliis . . . albus, albidus, cinereus, cæruliferus.*" It is the common gangart of Hungarian gold.

Rieſbeck aſſerts that theſe mines would be far more productive if they were farmed out by the crown.

ferent

ferent parts of coal, ſalt, and alum. Saltpetre is alſo produced in considerable quantities: and natron or ſoda is found in a lake near Kiſmaria, towards the frontier of Tranſylvania.[19] Such lakes are commonly white from the ſoda floating on the ſurface. But a mineral peculiar to Hungary, and as yet diſcovered in no other region of the globe, is the opal, a gem preferred to all others by the oriental nations. The opal mines are ſituated at Czerweniza, a ſhort day's journey to the N. of Kaſchaw, and nearly under the ſame latitude with Cremnitz. The hill in which they are found conſiſts of decompoſed porphyry; and they only occur at the diſtance of a few fathoms from the ſurface, of various qualities, from the opake white, or ſemi-opal, which is alſo diſcovered in Cornwall, to that utmoſt effulgence of irideſcent colours which diſtinguiſhes this noble gem.* MINERALOGY.

The mines of Tranſylvania and the Bannat are alſo numerous and valuable. Thoſe of Najiag, twelve Britiſh miles to the N. E. of Deva, were pretended to be diſcovered by a peaſant, who ſaid that he had obſerved a light ſhining in the evening over the ſpot. They produce the grey gold ore, being that precious metal mingled with antimony, arſenic, lead, and iron, and ſometimes with manganeſe and zinc.[20] They are the richeſt in all Tranſylvania, and conducted with the greateſt care and exactneſs. At Oſenbanya, about 25 Britiſh miles to the N. of Karlſburg is found the white gold ore, which alſo occurs in the hills of Fatzebay, in the ſame quarter. The country towards the W. of Karlſburg preſents numerous gold mines near Zalathna: and in the N. of this province are thoſe of Kapnick, Rodna, Felſobanya, and others. Mr. Eſmark alſo mentions thoſe of Veroſpatak, Kirnik, and Boitza, but ſome are exhauſted. At Ohlapian, not far from Zalathna, is found the fineſt gold in Tranſylvania, mingled with gravel and ſand.

[19] Journ. des Min. No. ii.

* It would appear that the opal of the ancients came from India, or rather Ceylon, and was of an olive colour with a red reflection. Launay *Mineralogie des Anciens*, Bruſſels 1803, two vols. 8vo. i. 130.

A carbonated ſubſtance, like black lead, paſſes through the vein of opal in Hungary. See Linnæus by Gmelin, the Lyons edition 1796, p. 285. Hence, probably the black opals, which are however extremely rare.

[20] J. des Min. No. xlvii. Eſmark.

The

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The chief mining town of the Bannat is Orawiza, on the W. of a chain of mountains, consisting of micaceous schistus, granite, and metallic rock; between which and Buda are chiefly plains of sand. Towards the S. of Orawiza are found mines of copper: and gold and silver at Dognaska to the N.

The salt mines acquired from Poland alone remain to be described. They are situated, as already mentioned, at Wielitska, eight miles to the S. of Cracow, being excavated at the northern extremity of a branch of the Carpathian mountains. The descent is by pits of great depth; and the galleries and chambers are of immense size, commonly supported by timber, or by vast pillars of salt, out of which material even subterraneous chapels are formed; but travellers have idly exaggerated the splendour and extent of the saline apartments.[21] The miners work by intervals of eight hours; after which they are drawn up, and their places supplied by others. The revenue arising from these mines was computed at near 100,000l. sterling yearly: but it has considerably declined since they became subject to Austria. The salt is of an iron grey colour, sometimes intermingled with white cubes; and sometimes large blocks of salt appear imbeded in marl.[22] The purest sort is found at the bottom of the mine, and is sparry. The mines extend about 3600 feet from E. to W, and about 200 from S to N. The salt is of the same identic kind with that found in Marmaros, on the other side of the Carpathian chain, or indeed throughout Transylvania, which contains a great number of salt mines, though not of considerable extent.

Mineral Waters.

The mineral waters in the Austrian dominions are very numerous, as is to be expected in a country so mountainous, with the exception of the great plain in the W. of Hungary, extending upwards of 250 miles in every direction. To instance a few; Tyrol presents those of Sellrain, Meran, Sexten, Prax, Agums, Brutz in the upper valley of the Inn, Trasp, Rabi, Pei, and others. In Stiria there are several; nor are Carinthia and Carniola destitute of this advantage. Austria Proper presents those of Baden; and Bohemia those at Carlsbad, Toeplitz, Agra, and Defny. Mineral springs abound in Hungary, as at Gran,

[21] Coxe's Pol. i. 200. [22] Townson, 388.

Buda,

Buda, Grosswardin, where the hot baths are frequented by the neighbouring Walachians. In the N. are those of Rank, Bertfeld, and others. Mineral Waters.

Among the natural curiosities may be named the grand Alpine scenes of Tyrol, the glaciers and peaks of the Brenner. At Gannowitz in Stiria is a fountain whose waters are said to be warm in winter and cold in summer: a common error, the deception consisting in their preserving the same temperature. The calcareous hills of Carinthia afford many singular scenes; which are however exceeded by those of the Carnian Alps, or Birnbaumer mountains, of Carniola. In the latter country, near Adlsberg, is said to be a grotto of prodigious extent, displaying spaces sufficient for the erection of villages, and containing natural amphitheatres, bridges, &c.[24] Near the entrance the river Poig, which rises at about a mile distant, throws itself into the hollow of the rock, and passes under the grotto, which was perhaps the ancient course of the river. The grotto of St. Mary Magdalen, in the same district, is remarkable for beautiful pillars; and that of Lueg for extent and the variety of stalactitic figures. Nor is that near St. Serf unworthy of notice. But the chief natural curiosity of Carniola is the lake of Cirknitz, called by Dr. Brown the Zirchnitzer See. That traveller informs us that it is about two German, or more than eight English miles in length, by four of the latter in breadth. In the month of June the water descends under ground, through many apertures at the bottom; and in September it reascends with considerable force; thus yielding rich pasturage in summer, while in winter it abounds with fish. The calcareous hills and islands of Dalmatia contain similar curiosities; as the lake Jesero in the isle of Cherso, which only diffuses its waters every fifth year;[25] several curious caverns; and prodigious quantities of fossil bones, of horses, oxen, sheep, &c. but doubtful if any be human; nor have any decidedly such been discovered in any region of the globe. Austria, Bohemia,* and Moravia, Natural Curiosities.

[24] Busching, vii. 60. [25] Fortis, 429.

* Near Trautenau is a most singular assemblage of natural towers of stone, from 60 to 150 feet in height. This stony forest is of great extent, and is by some supposed to be the skeleton of a hill. Riesbeck, ii. 148.

NATURAL CURIOSITIES.

display few natural curiosities; but those of Hungary are numerous, besides the Alpine scenes of the Carpathian mountains. There is a cavern of prodigious extent near Szadello, about thirty British miles N. W. of Kashau.[26] It is, like all the other large caverns, in a hill of limestone; and is so crowded with large pendent stalactites as to become a dangerous labyrinth. Near Szalitze, in the same quarter, is another renowned cavern, which, like that mentioned in the account of France, contains a small glacier. At Demanovo, about sixteen British miles to the E. of Rosenberg, is another remarkable cave, containing many bones of wild animals which have taken shelter there, as not unusual in the caves of Germany.

[26] Townson, 313.

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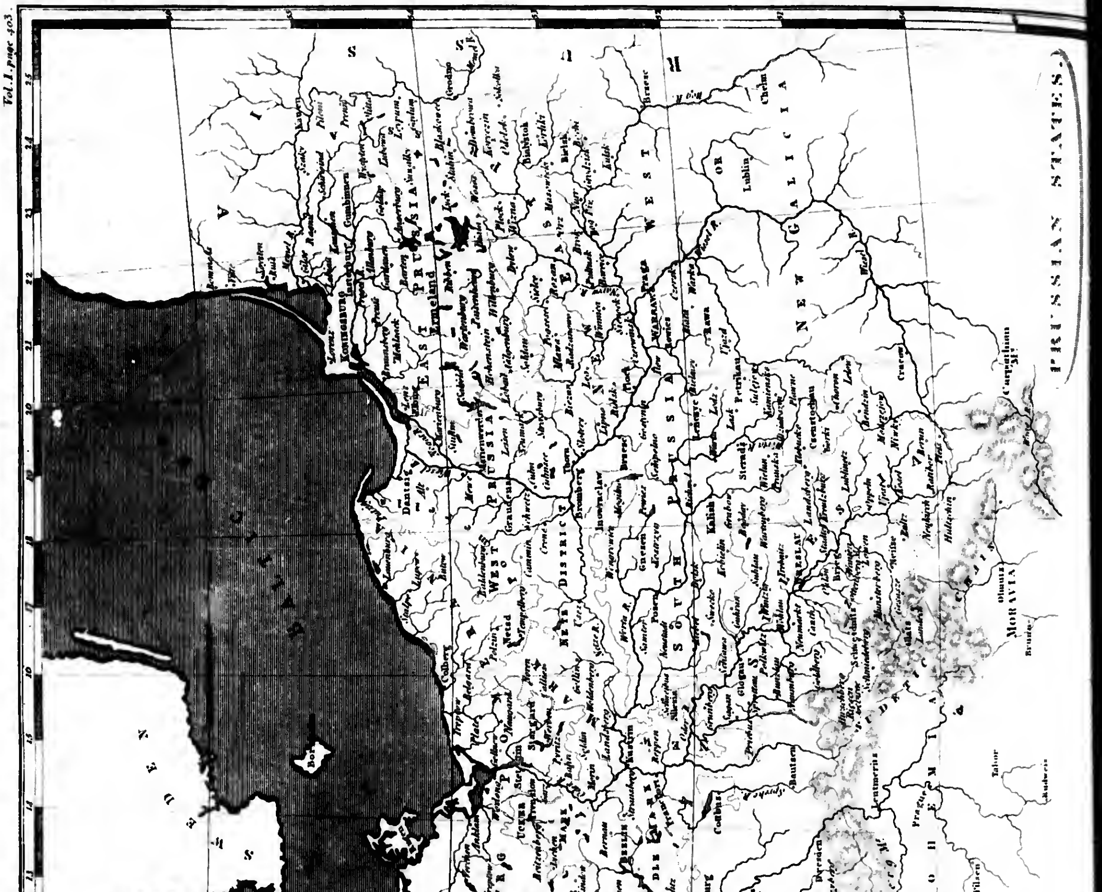

PRUSSIAN STATES.

PRUSSIA.

CHAPTER I.

Historical Geography.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

THIS kingdom, which only commenced with the eighteenth century, has by gradual acceſſions become ſo extenſive, as deſervedly to rank among the first powers of Europe. The dominions of Pruſſia were ſmall and [illegible], till the acquiſition of Sileſia, and afterwards of a third part of Poland, gave a wide and ſtable baſis to the new monarchy.

Names

This region was faintly known to the ancients, who mention various tribes that poſſeſſed it: and the amber, which here only was found in ſuch quantities as to form a regular article of commerce, greatly contributed to its celebrity. But antiquarian diſquiſitions are foreign to the preſent purpoſe; and it will be ſufficient to obſerve that the name of the country originates, according to ſome, from the Pruzzi a Slavonic tribe; but more probably, according to others from the name of *Ruſſia*, and the Slavonic word *Po*, which ſignifies near, or adjacent. Thus the Polabæ were confeſſedly ſo called, becauſe they were ſituated upon the Elbe, which is called Labe in the Slavonic dialect. Helmoldus,[1] who wrote in the twelfth century, and is the moſt ancient

[1] Lib. i. cap. iv.

chronicler

NAMES. chronicler of these regions, mentions the Pruzzi, or Prussians, among the chief Slavonic tribes: nor is the name unknown to Adam of Bremen, a writer of the preceding century.

Extent. Exclusive of small detached territories, the kingdom of Prussia now extends from Hornburg and the river Oker in the country of Halberstadt, the furthest western connected district, to the river Memel, or about 600 miles. The breadth, from the southern limit of Silesia to Dantzick, exceeds 300 miles. On the east and south, Prussia now borders on the dominions of Russia and Austria, and the western limits adjoin to the bishopric of Hildesheim if ambition have not extended them still farther. Before the recent acquisitions in Poland the number of Prussian subjects was only computed at 5,621,500, in a total extent of 56,414 square miles, that is about 99 to the square mile. At present they probably amount to about eight millions: including the margraviate of Anspach and Bareuth, computed at 400,000; and the last acquisitions in Poland estimated at 2,100,000 inhabitants.[a]

Original Population. The original population of Prussia appears, from Tacitus and Pliny, to have consisted of the Peucini and Æstii, Gothic tribes bordering on the Venedi who were Slavons. The amber of the Æstii, who seem to have been merely a tribe of the Peucini, continued to be celebrated in the time of Theodoric; but at what precise period these original inhabitants were expelled, or subdued, by the Slavonic tribes on the east, remains uncertain. Suffice it in general to observe, that the Slavonic tribes ex-

[a] Gaspari Allgem. Jahrbuch, 1800. Weimar.

Prussia has recently ceded the countries of Anspach and Bareuth to the French arrangements in Germany; and has thus lost the population of about four hundred thousand. It was, however, understood, that she was to be amply recompensed by the acquisition of Hanover. It is certainly the true interest of Great Britain that Prussia should not only remain in possession of Hanover, but should also obtain the whole dominions formerly belonging to Poland, and all the north of Germany, with Holland as far as the Rhine. These dominions, with Denmark and Sweden in strict alliance, can alone enable Prussia to act as an independent power against the preponderance of France. It would be truly singular to suppose that Prussia, with a population of between seven and eight millions, could withstand the French empire with thirty-four millions, nor can she ever act with cordiality towards allies, who, instead of strengthening her power, and enlarging her dominions, vainly expect assistance by the diminution of her influence!

Prussia has also ceded Neufchatel and Vallengin, which have been assigned, as an independent principality, to Marshal Berthier.

tended

tended widely over the N. of Germany, after the old Gothic inhabitants had crowded to the more fertile regions of the ſouth, in conſequence of the decline and fall of the Roman empire. But the reaction of the knights of the Teutonic order, in the twelfth and following centuries, deſtroyed great numbers of the Slavons, and in ſome meaſure reſtored the original Gothic population. Yet one half of the Pruſſian population muſt ſtill be conſidered as Slavonic; as to the former Pomeranians muſt now be added a numerous acceſſion of Poles. In general the Slavons are far more enſlaved by their chiefs than any of the Gothic nations; and it is believed that the Poliſh people, however they may execrate the iron rod of Ruſſia, will have no cauſe to regret that they have paſſed under the Auſtrian a . . Pruſſian ſceptres. ORIGINAL POPULATION.

The progreſſive geography of thoſe provinces which now conſtitute the Pruſſian territory would form an embroiled and multifarious topic. Ptolemy's eighth map of Europe preſents a very confuſed idea, and imperfect information. The voyage of Ohter, in the reign of Alfred, affords a faint dawn of modern knowledge; which is increaſed by the deſcriptions of Adam of Bremen, and Helmoldus. One of the moſt ſingular features in the geography of theſe regions, during the middle ages, is the exiſtence of Julin, a city of great extent and commerce, on the right bank of the Oder in Pomerania, which was deſtroyed by Waldemar I king of Denmark, ſo that even the name hardly now exiſts in a place called Wollin. Further to the eaſt the Slavonic tribes on the Baltic continued Pagans to a late period; and the country was little known, or viſited, except by a ſpecies of cruſaders, who went to aſſiſt the Teutonic knights in ſubduing thoſe Saracens, as they were ſtyled in the ignorance of the times. Progreſſive Geography.

As this kingdom is recent, and compoſed of ſeveral ancient ſtates, its hiſtorical epochs, and antiquities are of courſe complex. Not to mention the ſmaller provinces, among which was the diſtant principality of Neufchatel, on the frontiers of France, and Swiſſerland, Pruſſia may be regarded as conſiſting of four great diviſions, the electorate of Brandenburg; the kingdom of Pruſſia Proper; the large province of Sileſia; and a third part of the ancient kingdom of Poland. As the family which now rules thoſe extenſive domains was originally the electoral Hiſtorical Epochs.

houſe

Historical Epochs.

houſe of Brandenburg, it will be proper firſt to trace the progreſs of its power.

1. The German genealogiſts derive the houſe of Brandenburg from Thaſſilo count of Hohenzollern, who lived about the ninth century. Sigefred, a Saxon count, having married a daughter of Henry king of Italy, was appointed Margrave of Brandenburg A. D. 927; but many centuries elapſed before this dignity fell to the anceſtor of the preſent family. The province had been for ſome centuries chiefly poſſeſſed by Slavonic nations, but the Margrave ſoon raiſed it to conſiderable diſtinction. The ſucceſſion of theſe potentates, of various families, and their petty wars would little intereſt the reader.

2. The emperor Charles IV, in 1373, aſſigned Brandenburg to his ſecond ſon Sigiſmund, who in 1415, being then emperor of Germany, ſold this Margravate and Electorate to Frederic burgrave of Nuremburg, for 400,000 ducats. Frederic, the anceſtor of the preſent reigning race, diſplayed conſiderable abilities.

3. Joachim II, elector of Brandenburg, embraced the Lutheran religion in 1539, which has ſince been the ruling ſyſtem of the ſtate.

4. John Sigiſmond becomes duke of Pruſſia in 1618. This ſucceſſion will be explained under the next diviſion of the hiſtorical epochs.

5. Frederic William, ſurnamed the great elector, ſucceeded his father in 1640; and in 1656 compelled the king of Poland to declare Pruſſia an independent ſtate, it having formerly been held of the Poliſh ſovereigns. This prince is highly praiſed by his royal deſcendant, the author of Memoirs of the houſe of Brandenburg, as the chief founder of the power of that family. He was ſucceeded in 1688 by his ſon,

6. Frederic III, who ſupporting the emperor in the conteſt for the Spaniſh ſucceſſion, was by him declared king of Pruſſia; under which title he was proclaimed at Konigſberg, on the 18th day of January, 1701, he himſelf placing the crown upon his head.

7. Frederic William II aſcended the throne in 1713; and in 1721 founded the city of Potſdam. But he was chiefly remarkable as the father of that great prince Frederic II,* who aſcended the throne in 1740,

* In the regal genealogy the name of Frederic alone is conſidered as diſtinct from that of Frederic-William.

and

and died in 1786, after a long and glorious reign; the moſt memorable and laſting event of which was the acquiſition of Sileſia from the houſe of Auſtria in 1742. Historical Epochs.

8. The ſhort reign of his nephew is known to every reader. The failure of the Pruſſian tactics in France and Poland convinced Europe that the great Frederic had been the ſoul of the machine. But theſe checks were recompenſed by the completion of the Pruſſian acquiſitions in Poland. The reign of his ſon, the preſent monarch, has hitherto been diſtinguiſhed rather by prudence than enterprize.

The hiſtorical epochs of Pruſſia Proper are not deſerving of much elucidation. The knowledge of the ancients concerning this country has already been explained. A faint dawn of hiſtory, in the middle ages, diſcloſes at the mouth of the Viſtula the Pruzzi, a Slavonic nation, who were afterwards ſubdued by the knights of the Teutonic order.

1. This order originated A. D. 1190, in the camp of the Cruſaders before Acca, or Acre, from ſome citizens of Lubec, and Bremen, who united to relieve the wants of their German brethren. Next year a bull of inſtitution was obtained from the Pope, ordering them to wear a black croſs on a white mantle, and to follow the rule of St. Auguſtin, with all the privilges granted to the knights templars. The cruſades to Paleſtine having failed, the knights directed their enterprize againſt the pagans of the N. of Germany, A. D. 1227; and in a few years conquered Pruſſia, and founded ſeveral cities.

2. The knights thus eſtabliſhed in Pruſſia directed their efforts againſt the Lithuanians, and other pagans in the eaſt. But repeated wars with Poland were leſs fortunate; and about 1446 the four chief cities of Pruſſia, Elbing, Thorn, Konigſberg, and Dantzick, withdrew their allegiance from the Teutonic order, and claimed the protection of Poland.

3. In 1466 Caſimir king of Poland forced the Teutonic order to abandon to him the eaſtern part of Pruſſia, and to pay homage for the weſtern part.

4. Albert of Brandenburg, grand-maſter of the order, obtained from his maternal uncle, Sigiſmund king of Poland, the hereditary inveſti-

Historical Epochs.

ture of all that the order poſſeſſed in Pruſſia, and embraced the Lutheran religion. But particular grand-maſters continue to be appointed by the emperor of Germany.

5. In 1569 Joachim II elector of Brandenburg had obtained from the Poliſh monarch the ſucceſſion to the duchy of Pruſſia, in caſe the poſſeſſor died without heirs: but this addition of power and territory did not take place till 1618, when John Sigiſmund elector of Brandenburg acquired this duchy; and in 1621, his ſucceſſor received the ſolemn inveſtiture from the king of Poland. Nor was it, as already mentioned, an independent ſovereignty till 1656, after which period the chief events may be traced under thoſe of Brandenburg.

Sileſia affords few materials for Hiſtory. This country was formerly a Slavonic province of the Poliſh dominion; but in the fourteenth century was ſeized by John of Luxemburg king of Bohemia, (February 1339,) and paſſed with that ſovereignty to the houſe of Auſtria. The houſe of Brandenburg certainly had ſome ancient claims to this province, which were finally aſcertained by the ſword in 1742, as already mentioned.

As not only the recent acquiſitions in Poland are of far more comparative conſequence to Pruſſia, than either to Auſtria, or Ruſſia; and as in fact this ſovereignty is in poſſeſſion of the metropolis, and all the chief cities, and ports of Poland, and may be ſaid to exiſt only on the baſis of that ancient kingdom, which it repreſents in the modern balance of power, it will be proper here to repeat, in a few words, the chief epochs of the Poliſh hiſtory.

1. Even in the Roman times Poland was chiefly poſſeſſed by the Sarmatæ, or Slavons; and the Poles pretend to trace their dukes from the ſixth century. But the authentic hiſtory only begins with Piaſt, A. D. 842. In 992 the chriſtian religion was introduced.

2. Uladiſlas, duke of Poland, aſſumed the title of king A. D. 1320; and was ſucceeded by his ſon Caſimir ſurnamed the great.

3. The houſe of Jagellon dukes of Lithuania aſcended the Poliſh throne 1384, and ruled till 1572, in hereditary ſucceſſion, though with pretended election.

4. The

4. The throne of Poland becomes merely elective in the perſon of Henry de Valois 1574; but it was afterwards chiefly conteſted by native princes, and by the electors of Saxony. HISTORICAL EPOCHS.

5. John Sobieſki, king of Poland, in 1683 forced the Turks to raiſe the ſiege of Vienna, which was the laſt valiant action achieved by the Poles.

6. The recent annihilation of the monarchy.

From this general view of the component parts of the Pruſſian hiſtory it will appear that few ancient monuments can be expected in regions, where even a rude knowledge of the arts is comparatively ſo recent. Some Slavonic idols, caſt in bronze, conſtitute almoſt the only pagan antiquities: and the caſtles, and churches, erected after the introduction of the Chriſtian religion, have few ſingularities to attract particular attention. The Poliſh coinage begins about the twelfth century, and is upon the German model. Antiquities.

CHAPTER II.

Political Geography.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

Religion.

THE ruling religion of Prussia is the Protestant, under its two chief divisions of Lutheran and Calvinistic. But after the recent acquisitions in Poland it would seem that the greater number of the inhabitants must be Roman Catholic. The universal toleration which has been wisely embraced by the Prussian monarchs, has had its usual effect of abating theological enmity, and the different sects seem to live in perfect concord.

Ecclesiastic Geography.

The ecclesiastical geography of Prussia would be at once little interesting, and of difficult detail. The bishoprics in Poland and Silesia seem to retain their ancient limits, while the power of the prelates is considerably abridged.

Government.

As no vestige of any senate or delegates from the people is known in this kingdom, it must be pronounced an absolute government, but the spirit and good sense of the nation unite with the wisdom and mildness of successive monarchs, (who have uniformly wished to invite foreign settlers by views of ease and freedom, instead of expelling their own people by rigour,) to render the sovereignty as conciliatory, and perhaps more beneficent, than if joined with a venal senate. The late great monarch reformed many abuses in the laws; but it cannot be disguised that the tenor of his government was too military, a fault inherent in the Prussian system. In some respects it is doubtless unavoidable, as must ever be the case, in establishing a new power. And when we behold every petty prince in Germany surrounded by the idle parade of a little army, which far from being necessary at home is often

Laws.

often ſold to other ſtates, we cannot wonder that the acquiſitions in Silesia, and in Poland, muſt be maintained by armed force, inſtead of ancient attachment and habits of ſubjection; eſpecially when we conſider that Pruſſia is environed by the great military powers of Ruſſia and Auſtria. All political plans muſt be weighed by the circumſtances; and this dire neceſſity muſt exiſt till the benignity of the government ſhall have gradually ſecured the firm attachment of its new ſubjects. Laws.

Before the acquiſitions in Poland, this kingdom was ſuppoſed to contain only about five millions and a half of inhabitants, including one million and a half in Silesia. But the late great acquiſition in Poland has greatly enlarged the number of inhabitants, which may be about eighty to the ſquare mile.* Population.

No foreign colonies have emigrated from Pruſſia; and it has been indeed a chief object with the monarchs to colonize the country itſelf. Colonies.

The army is ſuppoſed to amount to about 200,000, including about 40,000 cavalry. The tactics of the late able ſovereign conferred diſtinguiſhed reputation on the Pruſſian battalions, but they are now ſuppoſed not to exceed the Auſtrian; and military men conſider both as inferior to thoſe of Ruſſia, who ſeem to be juſtly regarded as the beſt troops in Europe. Army.

The acquiſition of Dantzick, and ſome other ports in the Baltic, may in time place Pruſſia among the maritime powers; but as little is to be gained or apprehended at ſea, it is natural that almoſt the ſole attention ſhould be paid to the land ſervice, which can alone ſecure the country againſt the exorbitant power of Ruſſia; for Auſtria has been ſo much enfeebled by the recent conteſt with France, that many years muſt elapſe before Pruſſia can have any apprehenſions from that quarter. Navy.

Before the additions of Poliſh territory the revenue was eſtimated at 3,880,000l. ſterling; and the expence of the army at 2,275,000.† Frederic II laudably expended about half a million ſterling yearly, in the improvement of his dominions. The entire revenue of Poland was not computed to exceed 439,546l. ſterling. If we even ſuppoſe half of this added to the Pruſſian revenue, the reſult would not be important; Revenues.

* See the note at the end of this chapter.

† Boetticher, p. 50.

Revenues.

but as the Polish aristocracy carefully guarded against taxes to be defrayed by themselves, it is to be presumed that a new and more legitimate form of government will compel them to contribute largely to the expences of the state; which, considering the bondage in which they have held the peasantry, there will be no cause to regret. And it may be expected, from the spirit of the Prussian goverment, that the sums thus justly exacted from the rich will be in a great measure expended in the improvement of the acquired country, which may thus yield a fair revenue proportioned to its extent. The late great monarch, clearly foreseeing the destructive consequences of the funding system, which has been embraced by some other European powers, with his usual ability pursued the opposite plan of laying up a treasure to serve in times of necessity, instead of adding the oppression of taxation to the horrors of war. This treasure is said to have been expended by his immediate successor; but still Prussia has the supreme advantage of freedom from national debt, whence the smallness of the revenue has never been regarded as detracting from its position among the chief European powers.

Political Importance and Relations.

The political importance and relations of this kingdom have impressed the European history of this century with new and distinct features. What Poland would have been, if blessed with a happier government, and executive energy, may be conceived from the present appearance of Prussia, exclusive only of one circumstance, that of contiguity with the Ottoman dominions. An alliance with Prussia would be indeed of supreme importance to the Turkish empire; nor can it be the interest of Prussia to permit Russia to extend her aggrandizements. Yet the Porte has few advantages to offer, while Russia might secure the alliance of Prussia, by conceding a further part of Poland to balance any great accession of Turkish territory.

In regard to the other chief powers of Europe, England, France, Russia, and Austria, an alliance of the first with Prussia has repeatedly been enforced by circumstances; but it cannot be disguised that there is a more necessary and important connexion between Prussia and France, as both have cause to be jealous of the Austrian power, which France can essentially injure, while England is by nature debarred from

any preponderating interference. But a chief province of Prussian politics must be the defence of the country against the arms and influence of Russia, for which purpose a most important step would be a firm alliance, cemented by every political tie and interest, between Prussia, Denmark, and Sweden; which, if the Russian empire remain undivided, will be the sole barrier of continental independence.* POLITICAL IMPORTANCE, &c.

* The following estimate of Prussian population is compiled from the sub-divisions of Hoeck, edit. 1801:

Eastern Prussia	940,000
Western Prussia	521,625
Southern Prussia	1,100,000
New Eastern Prussia	700,000
A part of Poland incorporated with Silesia	74,000
Pomerania	472,957
Brandenburg	755,577
New March	279,584
Magdeburg	275,262
Halberstadt	111,875
Minden	67,952
Ravensburg	81,812
East Friseland	102,594
Cleves	100,000
Mæra	17,000
Mark	121,984
Gelder	48,000
Tecklenburg	17,234
Lingen	23,432
Silesia	1,747,065
Anspach	215,256
Baireuth	205,440
Neufchatel and Valengin	42,500
	8,021,149

The revenues he computes sometimes in dollars, sometimes in florins, and in such minute subdivisions that the calculation would be very laborious.

The Prussian army, according to a particular table, amounts to 178,897 infantry, and 39,867 cavalry; forming with artillery, &c. a total of 237,089.

The intelligent author of *La Prusse, et sa neutralité*, 1800, 8vo, estimates, p. [illegible], the population at more than nine millions, but he is a panegyrist. The revenue he puts, p. [illegible], at above five millions sterling; and justly observes that this sum must be estimated, not in itself, but as compared with the cheapness of provisions, &c. so that it equals a far higher nominal revenue: and there is no national debt. The army, he says, p. 25, contains 224,144 men: there is no marine, the army requiring undivided attention.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs.—Language.—Literature.—Education.—Universities—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE manners and customs of a country composed of such various inhabitants, recently united under one sovereignty, must of course be discordant. Silesia, Poland, and other Slavonic regions, may be supposed to contain many peculiarities, which distinguish them from the Germans. The reign of the great Frederic, who entertained a predilection for the French language and manners, contributed to impart a similar tinge to his subjects; yet travellers appear not to have been much impressed with any striking dissimilitude between the manners of the Prussians and those common to the other Germans. They have indeed remarked that, in comparison with the Saxons, who are a lively and contented people, the Prussians appear dull and gloomy; a character which they impute partly to the military government, and partly to the general anxiety which must have been excited by the repeated dangers to which their country was exposed, when contending with the powers of Russia and Austria. As to the Poles, they seem full of life and action, but their features and general appearance are rather Asiatic than European. "Men of all ranks generally wear whiskers, and shave their heads, leaving only a circle of hair upon the crown. The summer dress of the peasants consists of nothing but a shirt and drawers, of coarse linen, without shoes or stockings, with round caps or hats. The women of the lower class wear upon their heads a wrapper of white linen, under which their hair is braided, and hangs down in two plaits. I observed several of them with a long piece of white linen hanging round the side of their faces, and covering their bodies below

their knees: this ſingular kind of veil makes them look as if they were doing penance. Manners and Customs.

"The dreſs of the higher orders, both men and women, is uncommonly elegant. That of the gentlemen is a waiſtcoat with ſleeves, over which they wear an upper robe of a different colour, which reaches down below the knee, and is faſtened round the waiſt with a ſaſh or girdle; the ſleeves of this upper garment are, in warm weather, tied behind the ſhoulders; a ſabre is a neceſſary part of their dreſs, as a mark of nobility. In ſummer the robe, &c. is of ſilk, in winter of cloth, velvet, or ſtuff, edged with fur. They wear fur caps or bonnets, and buſkins of yellow leather, the heels of which are plated with iron or ſteel. The dreſs of the ladies is a ſimple polonaiſe or long robe, edged with fur."[1] The ſame author obſerves that the Poliſh peaſants differ widely in their dreſs from the Ruſſian; the former in particular ſhaving their heads, and leaving only a circle of hair in the middle, while the Ruſſians wear their hair down to their eyebrows, and over the ears, and cut it ſhort around the neck.

The manners and cuſtoms of the people of Sileſia ſeem to reſemble thoſe of their neighbours the Bohemians; but both races have been ſo much melted down into that of the Germans, that the peculiar features are minute and unimportant.

The ruling language of Pruſſia is the German, which it is probable may in time ſupplant the Poliſh, in thoſe parts which are ſubject to Pruſſia and Auſtria. Language.

The literature of Pruſſia may well be conceived to be of recent origin; nor even after the reſtoration of letters did any remarkable author ariſe in the electorate of Brandenburg. But Dantzick was the native country of Cluverius, an eminent geographer; and Copernicus, a great name in aſtronomy, was born at Thorn, as his predeceſſor Regiomontanus was at Konigſberg, his name being a Latin tranſlation of that of his birth place. Sileſia has likewiſe few pretenſions to literary fame, nor are thoſe of Poland highly illuſtrious. Kadlubko, the moſt ancient Poliſh hiſtorian, wrote in 1223; and ſince his time there has been a ſucceſſion of Latin chroniclers. But as the exertions of German Literature.

[1] Coxe's Trav. into Pol. &c, i. 194.

genius

Literature. genius in the native language have been little known till the present century, the literature of Prussia has few pretensions, and must yield to that of Saxony, the classical seat of German letters. Frederic the great had a mean opinion of German literature; and, though he wrote in French, must be classed among the most distinguished authors of his kingdom. Nor is Count Hertsberg, his minister, without merit. Among the other names either natives or who flourished in Prussia, may be mentioned Ramler the poet, Nicolai an original writer of romances, &c., Busching the geographer, Spalding, and Mendelsohn.[1] Nor has Prussia yet produced any artists, painters, sculptors, or architects, of distinguished reputation.

Education. The state of education in this country seems to be equally neglected as in the far greater part of Europe. The number of recruits wanted for the army, and the consequent uncertainty of destination for life, must singularly impede the national instruction.

Universities. There are however several universities, such as that of Frankfort on the Oder, founded by Joachim elector of Brandenburg in the year 1516. Konigsberg in Prussia was founded in 1544. Of the Polish universities Cracow has fallen to Austria, and was founded in 1364; and Wilna, founded in 1570, to Russia. Posna or Posen has become subject to Prussia.

Cities and Towns. Berlin. Among the chief cities of Prussia must first be mentioned Berlin, situated on the banks of the river Sprey, and regularly fortified. It was founded in the twelfth century, by a colony from the Netherlands, and contains upwards of 140,000* inhabitants, being about four miles and a half long and three wide; but within this enclosure are many gardens, and sometimes even fields; nor is it easy to reconcile 6000 houses, as enumerated by Riesbeck, with the number of inhabitants computed by Boetticher. However this be, the city is more remarkable for the elegance of the buildings, than for its wealth or industry, many beautiful houses being let in stories to mechanics.

Konigsberg. Next to Berlin may be mentioned Konigsberg, of which the population is computed at about 52,000. This city was founded in the thirteenth century, and is well fortified. It maintains a considerable trade by the river Pregel, which flows into the gulph of Dantzick.

[1] Riesbeck's Trav. iii. 44.

* Hoeck says 142,099; houses 6950.

Breslaw,

Cities and Towns.

Breslaw.

Breslaw, the capital of Silesia, has been long celebrated as one of the most beautiful cities in Germany. It is of uncertain antiquity, but was destroyed by the Tatars in the thirteenth century. The population is at least equal to that of Konigsberg, and it has several manufactures, the linens of Silesia being particularly celebrated. The ruling religion is that of Luther.

Warsaw.

Among the chief cities of Prussia must not now be forgotten Warsaw, the former capital of Poland; and Dantzick, an independent city of ancient fame. Warsaw stands partly in a plain, partly on a gentle ascent rising from the Vistula, but the appearance is melancholy from the general poverty of Poland under its former unhappy government.[1] The population was computed at 70,000, including the unfortunate suburb of Praga; but it must have been much thinned by the destructive sword of Suwarrof. Yet Hoeck states it at 66,572.

Dantzick.

Dantzick contains about 36,000 inhabitants, and was known as a commercial town even from the tenth century. It was considered as the chief city of the Hanseatic league, and was enlarged and adorned by the knights of the Teutonic order. It must still be considered as the grand staple for the exportation of the corn and the other products of Poland; but its commerce has been for some time on the decline.

In the countries removed from the southern limits of ancient civilization, any formal enumeration of cities becomes less important, because those places which make an appearance on maps often derive their sole importance from their situation amidst surrounding deserts; and the expected city becomes, upon examination, an insignificant town. Yet a few other cities of the Prussian dominions deserve geographical enumeration, in a progress from the more ancient territories in the west, to the recent acquisitions in the east.

Other Towns.

In the electorate of Brandenburg, and in the adjoining duchy of Magdeburg on the west, may be named Brandenburg, a small city of 6,000 inhabitants; and Frankfort on the Oder, which contains about 16,000.

Potsdam.

Potsdam, a recent city, is situated on an island, amidst lakes and canals, and no expence has been spared in its decoration. The royal castle

[1] Coxe's Pol. i. 206.

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Cities and Towns.

was built in 1663, and it has ſince been a favourite reſidence of ſeveral Pruſſian monarchs. The inhabitants are computed at 26,000. The other cities, or rather towns in Brandenburg, ſeldom contain 5000 inhabitants; but the duchy of Magdeburg preſents the capital ſo called, which is ſuppoſed to hold about 26,000 ſouls, and is ſtrongly fortified with a citadel on an iſle in the Elbe. This city dates its origin from the time of Charlemagne; and can boaſt of elegant ſtreets and flouriſhing manufactures. The imperialiſts taking it by ſtorm in 1631, a dreadful ſlaughter enſued, the inhabitants who periſhed being computed at about 10,000. In the ſame duchy, but diſjoined by part of Upper Saxony, ſtands alſo Halle on the Saal, more than fifty miles to the S. of Magdeburg: the inhabitants of Halle are computed at 21,000. Nor muſt Halberſtadt, the capital of an adjoining principality, be omitted, as it contains about 12,500 ſouls; in which number it is rivalled by Quedlinburg in the ſame province. It may be remarked, in paſſing, that the Weſtphalian dominions of Pruſſia preſent no city of much account, and the remote town of Neufchatel contains only about 6000 ſouls.

Magdeburg.

On proceeding to Pomerania on the N. firſt occurs Stettin, a city on the Oder of ſome trade, and about 18,000 inhabitants. Thoſe of Stargard, in further Pomerania, are not eſtimated at above 6000.

In Pruſſia, properly ſo called, may be named Elbing, which is ſuppoſed to hold 14,000 ſouls. The other ſecondary towns rarely exceeded 3000 inhabitants, till acquiſitions of adjacent territory gave to Pruſſia Thorn, with a population of 10,000. Excepting Breſlaw, the capital, already mentioned, there are only three towns in Sileſia, which contain more than 6000 inhabitants; namely Glogau, Hirſchberg, and Schweidnitz. Nor if we exclude Warſaw and its ſuburbs, do any of the towns recently acquired in Poland even equal this population.

Edifices.

Some of the moſt ſplendid edifices of this country adorn Berlin the capital, ſuch as the palace and the theatre. But the other grand buildings ſeem not to have impreſſed travellers with veneration, being barracks for ſoldiers and the like.[1] And the city itſelf is almoſt entirely built with brick, though the fronts of the houſes are diſguiſed with

[1] Wraxall's Mem. i. 101.

ſtucco.

ſtucco. The palace at Potſdam deſerves ſuperior applauſe; and on an eminence near that city ſtands the royal villa of Sans Souci, which however can claim no grandeur of external architecture. Konigſberg, and Dantzick, alſo offer to view reſpectable public buildings; but in general this kingdom yields even to Ruſſia in this reſpect. Edifices.

The advantages of inland navigation ſeem little known or cultivated in the Pruſſian dominions; and though ſeveral ſmall canals might be mentioned, yet they rather belong to the office of the topographer than to a general ſyſtem of geography. Inland Navigation.

If we except the linens of Sileſia, the manufactures of the Pruſſian dominions are of ſmall importance. Yet they afford for home conſumption, glaſs, iron, braſs, paper, and woollen cloth; and Frederick II introduced a ſmall manufacture of ſilk. Even the exports of Dantzick conſiſt almoſt entirely of timber, corn, tallow, and ſimilar articles. Manufactures and Commerce.

Nor if we except the ancient ſtaple of grain ſo abundant in the level plains of Poland, can the commerce of Pruſſia appear in an important light. Amber is by nature conſtituted a monopoly of the country, but faſhion has rendered this branch of commerce inſignificant. Yet among the conſiderable exports may be named excellent timber of all kinds, ſkins, leather, flax, and hemp; nor muſt the linens of Sileſia be paſſed in ſilence, many of which are ſent into Holland, and ſold under the name of Dutch manufacture. In return Pruſſia receives wine, and other products of more ſouthern and favoured countries.*

* For more minute particulars Hoeck may be conſulted. The amber amounts to near 200 tons annually. In 1777 there were in Further Pomerania 219,991 mulberry trees; yet the pure ſilk is only computed at 680 pounds weight. Brandenburg exports timber, from Hamburg, to the amount of one million of dollars. In Sileſia (1795) there were 40,603 perſons employed in the linen manufacture; and 13,540 in the woollen. Memel exports much timber to England.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of the Prussian dominions is, upon the whole, cold and moist. That of Brandenburg, which is an extensive level of sand, and that of Pomerania, may be regarded as more free from humidity than that of Prussia Proper, which, as Busching informs us,[1] has about eight months of winter, the autumns being often deluged with rain. The northern part of Poland, which has fallen under the Prussian sceptre, abounds with forests and marshes, which cannot be supposed to render the air salubrious. The lower parts of Silesia are regarded as the most healthy and fertile provinces of the monarchy; but the southern, and western parts of that duchy, bordering on elevated mountains, long covered with snow, are exposed even in summer to severe freezing gales.

Face of the Country.

In considering the general appearance of these extensive regions, Brandenburg is a sandy, and barren country, but Prussia Proper formerly abounded in woods, and displays superior fertility, a character which may also be extended to Prussian Poland, an immense plain. Silesia, on the contrary, displays a pleasing diversity, being level and open towards Poland, but separated from Hungary on the S. by the Carpathian mountains, a branch of which proceeding N. W. divides this country from Moravia, and Bohemia. It is every where watered by the Oder, and its tributary streams: nor is there any deficiency of rivers in the other parts of the Prussian sovereignty.

Soil and Agriculture.

The soil of Brandenburg is meagre, and even the space between Berlin and Potsdam resembles a wilderness; but that of Prussian Poland

[1] iii. 5.

is

is loamy and fertile. The northern extremity of Silesia shares the sandy soil of Brandenburg, yet this province is in general extremely productive, and abounds in fruits and culinary vegetables. SOIL AND AGRICULTURE.

Agricultural improvements are little known, and Brandenburg chiefly produces scanty crops of rye; but Prussia Proper, and the Polish provinces display every kind of grain and esculent plant, that can flourish under such a latitude; and among the productions of Silesia must be classed maiz, and even vines, but the wine is of inferior quality.

Such are the general ideas to be derived from Busching, and other German geographers; but an intelligent traveller, or rather observer, of our own country has thrown a strong light on this important topic, and a few of his observations shall here be transcribed.[2] The soil of Prussia Proper he represents as sandy and ill-cultivated, yet the peasants, though oppressed by heavy taxation, being free from the wanton extortions, and capricious personal services, exacted by the Polish aristocracy, displayed signs of comparative ease and prosperity. The soil being light, two oxen, or sometimes even a small horse and a cow, are sufficient to draw the plough. The chief crop was buck-wheat, which they found more profitable than barley; and this grain was generally cultivated, along with a few Swedish turnips, except in the neighbourhood of Dantzick, where the abundance of manure assured plentiful crops of wheat. In different parts of Silesia the land is let in farms, as in England, and the peasants hired as day-labourers; while under the detestable government of Poland they were mere slaves, and every avenue to industry was barred. In speaking of the continuous sandy soil of Brandenburg, he observes, "that they find that the only very profitable crop upon these sands is buck wheat, which they sow in large quantities, and they get a product which equals the best soils applied to that grain: when a piece of land has been more carefully managed than ordinary, it will yield a good crop of rye; but as to wheat or barley it is hardly to be seen." Between Berlin, and Saxony he finds a continuation of the same crop, with turnips and rye, which he supposes to be the sole agricultural

[2] Marshall's Travels, iii. 240, &c. said to have been written by Sir John Hill.

products

Soil and Agriculture.

products in these regions. In Saxony the soil becomes a good loam, yielding tolerable crops of wheat.[1]

Rivers. Elbe.

Among the chief rivers of the Prussian dominions may be first mentioned the Elbe, which rises in the S. of Bohemia, and pervades the duchy of Magdeburg. The Spree, which passes by Berlin, falls into the Havel, a river tributary of the Elbe. The Oder, the Viadrus of the ancients, may be regarded as a river entirely Prussian: it rises in the mountains of Moravia, and after watering Silesia, Brandenburg, and Pomerania, joins the Baltic, after a course of about 350 miles. Next appears another noble stream the Vistula, which rising in the Carpathian mountains, passes Warsaw, and joins the sea near Dantzick, after a circuit of about 450 miles. The Pregel passing by Konigsberg, springs from some lakes and marshes in Prussian Poland; and the Memel, a superior river, now forms, in part, the Prussian boundary on the east.

Oder.

Vistula.

Lakes.

The lakes in the Prussian dominions are numerous, especially in the eastern part, where among others may be mentioned the Spelding See, which, with its creeks, extends more than twenty British miles in every direction. That region contains many other lakes, which supply the sources of the river Pregel. At their estuaries the rivers Oder, Vistula, and Memel, present singular inland sheets of water, in the German language called *Haffs*; that of the Oder being styled Grafs Haff; that of the Vistula, Frisch Haff (with another inland creek called the lake of Drausen); and that of the Memel, Curisch Haff. The Frisch Haff is about seventy miles in length, and from three to ten miles broad, being separated from the Baltic by a long slip of land, said to have been thrown up by the tempests and waves about the year 1190. This lake or bay is of small depth, and will not admit vessels of much burthen.[2]

Curisch Haff.

The Curisch Haff, so called from its situation in the ancient duchy of Courland, is about 60 British miles in length, and about 30 in its greatest breadth. A similar ridge of land divides it from the Baltic; and it is full of dangerous shelves, and infested by frequent storms.

[1] Marshal's Travels, iii. 288. [2] Busching, iii. 10.

Magdeburg,

Magdeburg, Brandenburg, Pomerania, Pruſſia, and Poland, are in general level countries; and the only mountains in the Pruſſian dominions are thoſe of Sileſia. The mountains in the S. and W. of this province may be regarded as a northern branch of the Carpathian chain, which itſelf forms the moſt ſouthern boundary. This branch extends from Jablunka S. E. to Friedberg in Upper Luſatia, N. W. near 200 Britiſh miles in length, and is called Sudetiſche Gebirge, or the Sudetic mountains; but has alſo more minute appellations, the N. W. part towards Luſatia being called Rieſen, the middle part the Bohemian, and the S. E. the Moravian chain. Of this remarkable chain, which has eſcaped the attention of moſt geographers, and drawers of maps, the higheſt peak in the mountains of Rieſen, or of the giants, is the Schneekoppe, or ſnow head, in the Bohemian part, the Eule, or Owl, and the Zotenberg. The Moravian ridge divides into inferior branches, one of which forms a northern boundary of the principality of Troppau. In the north-weſtern parts of Sileſia are alſo detached mountains of conſiderable height,[1] as the Spitzberg, and Gratzberg, the Ruheberg, the Georgenberg, and the Reichenbach. Of theſe mountains the preciſe height ſeems not to be aſcertained, yet they may ſafely be concluded to yield greatly to the Carpathian chain, an account of which will be found in the deſcription of the Auſtrian dominions.*

Mountains.

Sudetic Chain.

Few parts of the Pruſſian kingdom are deſtitute of woods and foreſts, which particularly abound in Pruſſia Proper, and in the recent Poliſh acquiſitions. Towards Hungary Sileſia preſents a continuation of thick foreſts, which conſpire with the elevated mountains to form an impenetrable barrier.

Foreſts.

[1] Buſching, vi. 214.

* Buſching, vi. 283, informs us that the Zottenberg, between Schweidnitz, and Breſlau, is a celebrated mountain ſuppoſed to be the Aſciburgius of Ptolemy; which however rather ſeems to be the ridge of Erzgeberg. The height has been computed at about 2120 Rheniſh feet. On the S. it is connected with the Sudetic chain, but on all other parts is ſurrounded by a vaſt plain, and is ſuppoſed to derive its name from the neighbouring village of Zobten. This mountain conſiſts entirely of ſerpentine with ſome hornblende. Kirwan, Geol. Eſſ. 204.

Fabri computes the higheſt peak of the Rieſen at 4930 Rheniſh feet above the ſea, and the Zottenberg at 1700. The Sileſian mountains, he adds, yield ſome ſilver, tin, copper, and cobalt, with conſiderable quantities of calamine, lead, and iron: and there are quarries of marble, freeſtone, alabaſter, lime, and potters clay. Coal abounds near Schweidnitz.

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Botany. The indigenous vegetables of the Pruſſian dominions have hitherto been viewed in only a very curſory manner. Among theſe there do not ſeem to be any which have not already been ſufficiently noticed in the preceding accounts of Britain, and Auſtria. The mountainous ridges of Pruſſia being few, and of little importance, there is in conſequence a great deficiency of alpine plants, the prevailing vegetables being thoſe that inhabit level and ſandy diſtricts: the few following ones are all that it ſeems neceſſary to notice conſiſtently with our general plan. Calla paluſtris; aſarum europæum, *aſarabacca;* iris Sibirica, *Siberian iris;* lilium bulbiferum and martagon, *orange* and *martagon lilies;* laſerpitium latifolium, *laſerwort;* and nicotiania tabacum, *tobacco*, this plant, originally a native of America, and probably alſo of the eaſt, having been long cultivated in Pruſſia, has at length eſtabliſhed itſelf in the ſoil, and is found in the ploughed fields, and hedges as a common weed.*

Zoology. The breeds of horſes, and cattle ſeem not to have impreſſed travellers with any diſtinction from thoſe of the adjacent countries, and few parts are calculated for excellent breeds of ſheep. The urus, or large and ferocious wild cattle of Lithuania, have alſo appeared in Pruſſia Proper, but the race ſeems nearly extinct. One of its chief haunts was the foreſt of Maſovia not far from Warſaw. The marmot, and a ſpecies of caſtor, may alſo be claſſed among the wild animals; and among the more ferocious the lynx, an animal of the colder climates, about the ſize of a fox, but the face and motions rather reſembling thoſe of the cat. Nor are theſe regions unviſited by the bear and the elk. The Oder ſometimes affords ſturgeon of a large ſize.

Mineralogy. The mineralogy of the Pruſſian dominions will not afford an extenſive theme. Sand and plains rarely contain minerals, and even the mountains of Sileſia boaſt of few hidden treaſures. Yet in the ſouthern diſtricts of that province there were formerly mines of gold and ſilver, but the produce did not defray the expence, though in the time of Buſching two or three of the latter metal continued to employ ſome labourers. Mines of copper and lead however ſtill exiſt, and there are conſiderable founderies of iron. In the mines of Sileſia is

* Wulff, Flora Boruſſica.

found abundance of chryſoprafe, which has been detected in various ſtages of tranſition, and appears to be a ſemi-opal deriving its green tincture from nickel. Agates, jaſpers, and clear cryſtals of quartz, vulgarly called diamonds, are alſo found in the Silesian mountains. Coal, a more uſeful mineral, occurs in various parts of Sileſia, and the level diſtricts ſometimes offer good peat moors. MINERALOGY.

But the moſt diſtinguiſhed and peculiar mineral production of Pruſſia is amber, which is chiefly found on the Samland ſhore of the Baltic, near Pillau, on a neck of land formed by the Friſch Haff, which ſeems to have been the chief ſeat of this mineral from the earlieſt ages. Amber is allowed by the beſt mineralogiſts to be decidedly of vegetable origin, but mineralized by ſome operation of nature, ſimilar to that by which animal fleſh is converted into a ſubſtance reſembling ſpermaceti.[a] It is found at the depth of about 100 feet repoſing on wood coal, in lumps of various ſizes, ſome five pounds in weight, and is often waſhed on ſhore by tempeſts. By friction it becomes electric, and has imparted its Greek name to the modern philoſophy and doctrines of electricity. It adds about 5000l. yearly to the royal revenue.* Amber.

Sileſia preſents one ſpring of hot water at Warmbrun, near Hirſchberg, which is, as is believed, the only mineral water worth notice in the Pruſſian dominions. Mineral Waters.

The Sudetic chain of mountains has been little explored, and the level parts of the Pruſſian dominions can, of courſe, afford few objects of natural curioſity, if we except the mines of amber above-mentioned. Natural Curioſities.

[a] Kirw. ii. 66.

* In the *Journal des Mines*, No. 79, p. 37, may be found an intereſting account of the mines of Pruſſian Sileſia. They were begun about 1784, under the direction of the Count de Reden; and for iron are the moſt conſiderable in Germany. In the *Journal de Phyſique*, vol. 39. 1791, we are told, p. 365, of an amber mine in Pruſſia ninety-eight feet in depth, where the amber is found between two ſalbands of carbonated wood, and ſometimes adherent.

SPAIN.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progreſſive Geography.—Hiſtorical Epochs and Antiquities.

NAMES. THOUGH Spain appear to have been known to the Phœnicians, near 1000 years before the birth of Chriſt, and their Tarſiſh to have been the little iſle of Tarteſſus, near Gades, yet it ſeems hardly to have been diſcloſed to the Greeks in the time of Herodotus. It is probable that the whole country was the Tarſiſh of the Phœnicians and Hebrews, though the learned Huet rather reſtrict it to Betica, or the ſouthern part of Spain; which region was, as is well known, the Mexico of the Phœnicians, who from it imported large quantities of ſilver. When the Greeks eſtabliſhed a colony at Marſeilles, they muſt not long after have diſcovered the northern part of this fertile region; which from the noble river Iberus, or Ebro, they called Iberia; and from its extreme ſituation in the weſt it was alſo ſtyled Heſperia. The Romans, probably from a native term, have fixed and handed down *Hiſpania*; which has been variouſly adapted to the idiom of modern languages.

Extent. Spain lies between the 36th and 44th degrees of north latitude; and its weſtern extremity is about 9°. in longitude W. from London. The greateſt length W. to E. is about 600 miles; the breadth N. to S. more than 500; thus forming almoſt a compact ſquare, (if we include Portugal

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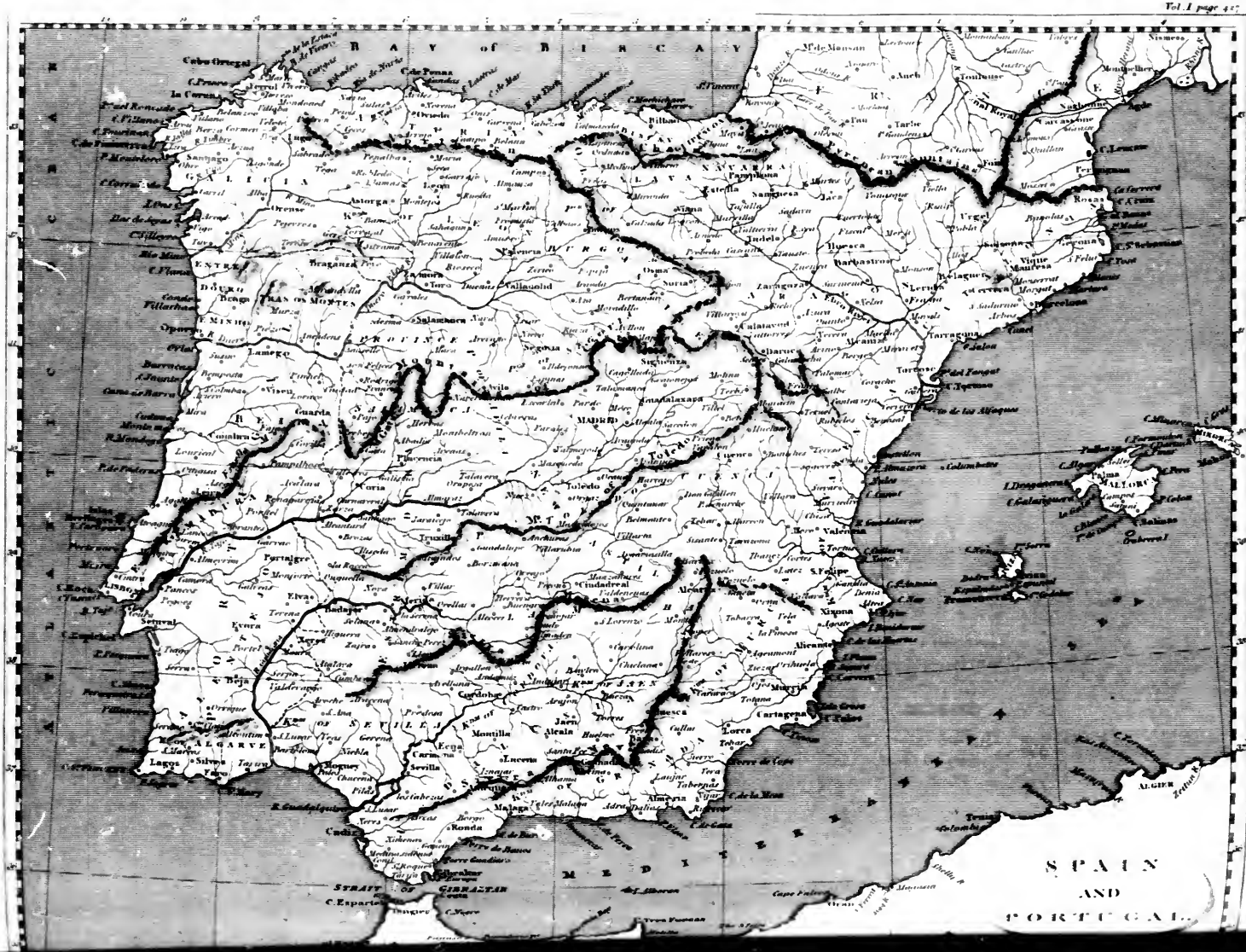
BAY of BISCAY
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AND
PORTUGAL
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MADRID
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BEIRA
ESTREMADURA
ALGARVE
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MURCIA
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NAVARRA
BURGOS
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Toledo
Seville
Cadiz
Malaga
Granada
Cordova
Valencia
Barcelona
Saragossa
Pampeluna
Bilbao
Santiago
Oporto
Coimbra
Salamanca
Valladolid
Segovia
Cuenca
Murcia
Cartagena
Alicante
Tarragona
Perpignan
Toulouse
Montpellier
Algier

Portugal in this general view of the country,) and surrounded on all sides by the sea, except where the Pyrenean chain forms a grand natural barrier against France.* But as the present estimate must exclude Portugal, which is reserved for another article, it may be observed that the boundaries betwixt these two kingdoms depend on artificial conventions, and not on rivers or mountains, or other remarkable features of separation. Spain is supposed to contain about 148,000 square miles; which, estimating the population at 11,000,000, yield 74 persons to the mile square. EXTENT.

Bourgoing has observed,† that the divisions of Spain received in maps and books of geography are little known in practice. The three provinces of *Biscay*, *Navarre*, under the title of a kingdom, and the *Asturias*, as a principality, form states apart, which neither admit custom-houses nor intendants, nor scarcely any appearance of fiscal government. In this respect all the rest of the monarchy is divided into twenty-two provinces for the crown of Castile; and four for the crown of Arragon. These provinces are of very unequal extent, those of Castile being the kingdom of *Gallicia*, the provinces of *Burgos*, *Leon*, *Zamora*, *Salamanca*, *Estremadura*, *Palencia*, *Valladolid*, *Segovia*, *Avila*, *Toro*, *Toledo*, *Mancha*, *Murcia*, *Guadalaxara*, *Cuenca*, *Soria*, and *Madrid*; and in fine Andalusia, which comprises four provinces, decorated with the title of kingdoms which they bore under the Moors, namely, the kingdoms of *Seville*, *Cordova*, *Jaen*, and *Granada*. The four provinces of the crown of Arragon are, the kingdom of *Arragon*, the kingdom of *Valencia*, the principality of *Catalonia*, and the kingdom of *Majorca*.

Spain is also divided into thirteen governments, of which twelve are ruled by captains general, while the governor of Navarre is styled viceroy. The provinces of Castile and those of Arragon differ considerably in the interior administration, and the form of levying the taxes.

The original population of Spain seems to have consisted of Celts from Gaul, and of Moors, Mauretani, from Africa; but the latter, a Original Population.

* The river Bidasoa forms the W. boundary, and near its mouth is the isle of Pheasants. Irum, near the Bidasoa, is the last town in Spain. Dillon, 133.

† i, 183.

ORIGINAL POPULATION.

more warlike race, expelled the former, and even paſſed into Aquitain in France. After the German Gauls had colonized the ſouth of modern France, where they were the Galli Braccati of antiquity, they began to make expeditions into Spain, where they ſeized the region to the N. E., and became the Celtiberi of claſſical geography. Hence the names of rivers and mountains in Spain rarely diſplay a Celtic origin, being often African, and unlike thoſe to be found in other parts of Europe, though recorded many centuries before the arrival of the Mahometans; and often Gothic, though mentioned before the Gothic invaſion in the fifth century. It is probable that the African ſettlers were not a little aſſiſted in the expulſion of the primeval Celts by the Phœnicians, and afterwards by the Carthaginians, whence the latter maintained ſuch ſway in diſtant parts of this country. But the records of Punic hiſtory being loſt, we muſt be contented to begin with the African colony;* which was ſucceeded, probably about 150 years before the Chriſtian era, by the incurſions and ſettlement of the Celtiberi, and other Gaulic colonies, who were only ſtyled Celts, as having paſſed from Celtic Gaul; for the names of places, and other ſtrong indications, denote their Gothic origin.

Towards the eaſt muſt be added large colonies of Carthaginians, and afterwards of Romans; for this country, which rivalled Italy in ſoil and climate, invited an unuſual number of the latter, and produced many claſſical authors. From its natural ſituation Spain has derived a greater mixture of inhabitants than perhaps any other European country. In the fifth century it was conquered by the Vandals; but, being afterwards weakened by their ſettlements in Africa, they were ſubdued by the Viſigoths, who founded the modern kingdom of Spain, and from whom the more ancient families ſtill pretend to derive their origin. The Mahometan Moors having been expelled, they muſt not be conſidered in the eſtimate, though a few families may be of Arabian extract: and the modern Spaniards may be conſidered as deſcended from the African Iberians, the Celtiberian or German Gauls, the Romans, and the Viſigoths.

* The language of the Iberi or African colony remains in the Baſque or Biſcayan.

The progreſſive geography of Spain is alſo very various. Little is known till the Roman conqueſt, when Spain was divided into three provinces, Tarraconenſis, or the N. E. half of Spain; Bætica, or Betica in the S.; and Luſitania on the weſt, extending from the river Douro in modern Portugal on the north, to the preſent boundary of that kingdom on the ſouth. After the ſubjection by the Viſigoths theſe diviſions ſeem to have paſſed into oblivion: but the conqueſt by the Moors eſtabliſhed a new and important diſtinction in Spaniſh geography, that of Chriſtian and Mahometan Spain; and which is in ſome meaſure blended with the topic next to be conſidered. PROGRESSIVE GEOGRAPHY.

The chief hiſtorical epochs of Spain are: Hiſtorical Epochs.

1. The original population by the Africans, and German Gauls.

2. The Carthaginian acquiſitions in Spain.

3. The conqueſt by the Romans, who maintained poſſeſſion for more than five centuries.

4. The ſubjection of Spain to the Vandals, about the year 415.

5. The conqueſt of Spain by the Viſigoths under Euric, excepting Galicia, held by the Suevi, who had entered with the Vandals. The Galicians have to this day a diſtinct character of ſuperior induſtry. In Euric, A. D. 472, commences the modern kingdom, and hiſtory of Spain. The Viſigoths were Arians.

6. The conqueſt by the Arabs, or Moors, which began A. D. 709, and ſoon extended over all Spain, except the mountains of Aſturias, where king Pelagius maintained a confined domination over that diſtrict, and Biſcay. His deſcendants fixed the royal reſidence at Oviedo, built in 761, and not only defended their ſmall territory, which was naturally fortified with chains of mountains, but ſoon regained Galicia, and part of Leon and Caſtile. In 914, as the territory extended towards the ſouth, the kings began to reſide at Leon, and thence derived their title; to which, in the eleventh century, was added that of Caſtile. But the Moors muſt be regarded as the chief poſſeſſors of Spain, till the middle of the thirteenth century.

7. The Mooriſh domination in Spain, which was conducted by governors appointed by the Chalifs till A. D. 756, when Abdoulrahman ſeized the ſceptre of Spain, and became the mooriſh king of Cordova, and

Historical Epochs.

and first chalif in the west. His successors continued to display great wealth and power; and under their sway the commerce of Spain become very extensive.[1] This dynasty continued till A. D. 1038, when the Spanish Chalifate expired, and the Moorish governors of several provinces usurped the royal style, in Cordova, Seville, Valentia, and Granada; who nevertheless rivalled the small Christian kingdoms till the middle of the thirteenth century, when, as already mentioned, the latter became preponderant, and Spain resumed her situation among the states of Christendom.

8. The kingdoms of Castile and Leon sometimes fell to distinct heirs; and the historical confusion is increased by the small kingdom of Navarre, the capital of which was Pampelona, a royalty which commenced A. D. 857: by that of Arragon, A. D. 1035: and other subdivisions.

9. The reign of Alphonso the wise, which began A. D. 1252; and which rivalled those of the Spanish Chalifs in the protection afforded to the arts and sciences.

10. The conquest of the kingdom of Granada, the last of the Moorish royalties; and the junction of the important crowns of Castile and Arragon, in the persons of Ferdinand and Isabella.

11. The reign of Charles V, son of Philip of Austria, who married the heiresses of Arragon and Castile, and established the Spanish monarchy on its present basis. The wealth of America, discovered in the reign of Ferdinand and Isabella, now began to impart exuberant supplies, and the power of Spain arrived at its zenith.

12. Acquisition of Portugal by Philip II, A. D. 1580.

13. The revolt of Portugal under Philip IV, A. D. 1640; which has since existed as a separate kingdom, after having been subject to the Spaniards for sixty years.

14. The termination of the Austrian Dynasty, by the death of Charles II, Nov. 1, 1700: and the accession of the house of Bourbon, since which no epoch of singular consequence has arisen.

Antiquities.

Of the first of these epochs it can hardly be supposed that any remains should exist, except a few tumuli, and other rude monuments.

[1] Hist. de L'Afriq. et de L'Esp. sous la Domination des Arabes, par M. Cardonne. Paris 1765. 3 vols. 12mo.

Nor are there any certain relics of the Carthaginians in Spain, except coins, which have been found in considerable numbers. ANTIQUITIES.

The Roman antiquities are, on the contrary, so numerous that to enter into details on the subject would be prolix, and foreign to the nature of this work. The aqueduct at Segovia is one of the noblest of the Roman edifices.[a] It consists of 159 arches, extending about 740 yards; and is rather more than 94 feet in height, where it crosses the valley. Morviedo, the ancient Saguntum, presents many curious remains of antiquity. The theatre is capable of receiving near 10,000 people, and is hewn out of the solid rock; a labour not so great as might be imagined, as the Spanish rocks are often gypseous, or calcareous. Tarragona, the ancient Tarraco, and capital of two thirds of Spain, also contains many curious monuments. In short the traveller will find abundance of Roman remains spread over this delightful country.

The Visigothic kings have left few relics, except their coins, which are struck in gold; a metal then unknown to the other European mints, and seemingly native. The churches, &c. of that period were probably destroyed by the Moorish conquest.

Numerous and splendid are the monuments of the Moors in Spain. The mosque at Cordova was begun by Abdourlrahman, the first chalif. The second chalif of that name reared the walls of Seville. But these princes were far exceeded in magnificence by Abdoulrahman III, who built a town three miles from Cordova, which he called Zehra, after the name of one of his female favourites; and ordered a palace to be constructed by the most skilful architects of Constantinople, then the chief abode of the arts and sciences (A. D 950.).[b] In this palace were reckoned 1014 columns of African and Spanish marbles; while Italy had supplied 19, and the Greek emperor had transmitted 140 of surprising beauty. The hall was decorated with marble, and massy gold; and in the midst of the cieling was hung the famous pearl which the Emperor Leo had sent to the Chalif. The expence of Zehra, the palace, and gardens, was computed at 300,000 dinars of gold annually, for twenty-five years, or about 2,500,000l. The mines of gold and silver, then wrought in Spain, conspired with extensive commerce to

[a] Townsend, vol. ii. p. 115. [b] Cardonne, ubi supra.

afford

ANTIQUITIES.

afford an ample revenue. Yet on the death of this magnificent prince a paper was found in his hand-writing, declaring that, during a prosperous reign of fifty years, he had only enjoyed fourteen days that were uniformly pleasant and agreeable. The mosque at Cordova still surprizes travellers with the multitude of columns, which are computed at 800; but the palace of Zehra appears to have been annihilated in the barbarous and fanatic wars of the middle ages: and Granada, the last Moorish kingdom, having been subdued after the arts and sciences began to revive, it is natural there to expect the best preserved remains of Moresque antiquity. Nor will their Alhambra disappoint this expectation, as the reader may judge from Mr. Swinburne's elegant drawings; but for the sake of brevity Mr. Townsend's description shall be preferred. "You enter first into an oblong court of 150 feet by 90, with a bason of water in the midst, of 100 feet in length, encompassed by a flower border. At each end is a colonade. From hence you pass into the court of the lions, so called because the fountain in the middle is supported by thirteen lions. It is adorned with a colonade of 140 marble pillars. The royal bedchamber has two alcoves, adorned with columns, and a fountain between them, in the middle of the room. Adjoining to this are two hot baths. The great hall is about 40 feet square, and 60 in height, with eight windows and two doors, all in deep recesses. Between this and the oblong court is a gallery of 90 feet by 16. All these lower apartments have fountains, and are paved either with tiles or marble, in checkers. The idea of the ceilings is evidently taken from *stalactites*, or drop-stones, found in the roofs of natural caverns. The ornaments of the friezes are arabesque, and perfectly accord with the Arabic inscriptions, which are here suited to the purpose for which each apartment was designed." Above is a suit of elegant apartments for the winter. This edifice was finished A. D. 1336.

The Christian antiquities of the middle ages consist of numerous churches, castles, and monasteries, as usual in other European countries.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

THE religion of Spain is the Roman Catholic, which in this country and Portugal has been carried to a pitch of fanaticism unknown to the Italian states, or even in the papal territory. The inquisition has, in these unhappy kingdoms, been invested with exorbitant power, and has produced the most ruinous effects, having been formerly conducted with a spirit totally the reverse of the mildness and charity of christianity. This evil has been recently subdued in a considerable degree; but one fanatic reign would suffice to revive it. A yet greater evil, which has sprung from fanaticism, is the destruction of morals; for the monks being extremely numerous, and human passions ever the same, those ascetics sometimes atone for the want of marriage by the practice of adultery; and the husbands from mere piety are constrained to connive at this enormous abuse. The conscience is seared by the practice of absolution; and the mind becomes reconciled to the strangest of all phenomenons, theoretic piety and practical vice, united in bonds almost indissoluble. RELIGION.

According to the returns made to the government, the Spanish clergy stand as follow:[1] Ecclesiastic Geography.

Parochial clergy, called curas	-	-	16,689
Assistants, called tenientes curas		-	5,771
Sacristans or sextons	-	-	10,873
Acolitos, to assist at the altar	-	-	5,503

[1] Townsend, ii. 213.

Ecclesiastic Geography.

Ordinados de patrimonio, having patrimony of three reals a day - -	13,244
Ordinados de menores, with inferior ecclesiastical orders - - -	10,774
Beneficiados, or canons of cathedrals, and other beneficiaries - -	23,692
Monks - - -	61,617
Nuns - - -	32,500
Beatas - - -	1,130
Syndics, to collect for the mendicants -	4,127
Inquisitors - - -	2,705
	188,625*

The archbishops are eight; bishopries forty-six. The most opulent see is that of Toledo, which is supposed to yield annually about 90,000l.[a] The Mozarabic Missal, composed by St. Isidore for the Gothic church, after the conversion from Arianism to the Catholic faith, continued to be used in Spain till the Moors were subdued, when the Roman form was introduced, but the Mozarabic is still used in a chapel at Toledo.

Government. The government of Spain is well known to be despotic, the states or Cortes having hardly been assembled since the time of Charles V.† Dr. Robertson's history of that reign may be consulted for an able view of ancient Spanish liberty. If the late monarchs had been as much addicted to mass as to the chace, it is probable that the inquisition would have become the chief power in Spain. The despotism of the monarchy, which might in the hands of an able and intelligent prince be attended with great benefit to the nation, by the instantaneous extinction of abuses, is here balanced by the power of the church, to which even the

* Others compute the clergy at 400,000. MS. notes.

[a] Townsend, i. 311.

† There never were, however, general Cortes of Spain. Castile and Arragon had each their Cortes, but they never met together. MS. notes.

See also the *Tableau de l'Espagne Moderne, par J. F. Bourgoing.* Paris, 1803, three vols. 8vo. which, as I have been assured by persons long resident in the country, is the best account yet published. The journey of Fischer, London, 1802, 8vo. may be regarded as an interesting supplement. Bourgoing had resided at different times ten or twelve years in Spain.

nobles are ſubmiſſive devotees.* It is tempered, as uſual even under oriental deſpotiſm, by many councils, who are reſponſible for any unwiſe or unſucceſsful meaſures; for power is intimately connected with capacity, and when deſpotiſm is arraigned, there is often more cauſe to lament the mere indolence of the deſpot, who, inſtead of exerting his power for the general benefit, commits it to others for their peculiar advantage. The chief councils in Spain are: 1. That of diſpatches, called alſo the junto or cabinet council, being compoſed of the king and his miniſters of ſtate. 2. The council of ſtate, in which the king preſides, and of which the archbiſhop of Toledo is always a member. 3. The royal council of finances, called the Hazienda. 4. The ſupreme council of war. 5. The ſupreme council of Caſtile. 6. The ſupreme council of Arragon. 7. The ſupreme council of the inquiſition. 8. The royal council of the orders of knighthood. 9. The royal council of the Indies. 10. That of the Cruſada, compoſed of a commiſſary general, a member of the council of Caſtile, and another of that of Arragon, who arrange the ſale of little papal bulls, granting certain indulgences to the purchaſers. The grandees of the kingdom, who were formerly ſtyled the Rich Men, have ſeveral privileges; among which an important one in their eyes is that of wearing their hats in the royal preſence, which is however never done except at the nod of the ſovereign. GOVERNMENT.

The laws of Spain are contained in ſeveral ancient codes; and recourſe is alſo had to the civil and canon law. The *Eſcrivanos*, or attorneys, are numerous, and inſtead of explaining the codes, often impede the adminiſtration of juſtice. Miſtaken mercy frequently retains criminals in long durance, ſo that when they are executed their offence is forgotten, and the example of puniſhment becomes inefficacious. LAWS.

The population of this kingdom is computed at 11,000,000, or 74 to a ſquare mile; while France yields 174, and England 169: nay the kingdom of Naples is computed at 201. This ſtriking defect of population has deſervedly excited attention; and a late intelligent traveller[3] has attempted to aſſign the reaſons, among which may be numbered the expulſion of the Jews after the conqueſt of Granada: that of the Moors by Philip III; the contagious fevers frequent in the ſouthern provinces; the Population.

* The power of the church againſt the crown is not greater than in England. MS. notes.

[3] Townſend, ii. 218.

POPULATION.

inceſſant inteſtine wars, for ſeven centuries carried on againſt the Moors; the emigrations to America; and the vaſt numbers of unmarried clergy and monks. Several other cauſes are enumerated, among which muſt not be forgotten the want of detached farms;* the ſtruggles with the Moors having inſtituted a rooted prejudice which induces the yeomanry to crowd in towns and villages, as if for mutual defence, inſtead of ſpreading over and enriching the whole face of the country.

In the year 1787 the population of Spain was thus arranged:[4]

Males unmarried - -	2,926,229
Females ditto - -	2,753,224
Married men - -	1,947,165
Married women - -	1,943,496
Widowers - -	235,778
Widows - - -	462,258
	10,268,150

Excluſive of the clergy, who are above enumerated, the numbers of each rank were thus calculated:[5]

Men ſervants—Criados -	280,092
Day labourers—Jomaleros -	964,571
Peaſants—Labradores -	917,197
Artiſans - - -	270,989
Manufacturers - -	39,750
Merchants - - -	34,339
Knights—Hidalgos - -	480,589

"Of theſe laſt four hundred and one thouſand and forty are in the provinces of the Aſturias, Biſcay, Burgos, Galicia, and Leon."

In the moſt uncivilized regions gentlemen, or rather idle men, are always the moſt abundant; where the civilization advances they are ſupplanted by a much more uſeful and reſpectable race, the men of induſtry: but the *hidalgos* are often induſtrious farmers and labourers.

Colonies.

After the immortal diſcoveries of Criſtoval Colon, called by writers in Latin Chriſtopher Columbus, the Spaniſh colonies ſoon became

* The effect of the Meſta, or wandering flocks, muſt not be forgotten.

[4] Townſend, vol. ii. 213. [5] Ibid. vol. ii. 214.

numerous

numerous and extenſive, in the Weſt Indies, South America, and various isles in the Pacific Ocean. No nation, except the Engliſh, can in this reſpect rival Spain. But the ſuperior advantages of England, in religious and political freedom, have ſoon replaced the population thus withdrawn; while to Spain the wound has been incurable, as the cauſes of depopulation have always increaſed: and foreigners will never ſeek an aſylum where they are deſpiſed, and loaden with the chains of the inquiſition, or the yet heavier bonds of ignorant pride and prejudice. Colonies.

The Spaniſh armies, inſtead of carrying terror even into the braveſt countries of Europe, as they did two centuries ago, are now neither diſtinguiſhed by number, nor by diſcipline; the royal treaſury being ſo much impoveriſhed, that a large force cannot be maintained. In peace it is computed at about 60,000: but in war the number might be ſwelled to a great amount, by a popular monarch, and an ample revenue. Of late Spain has paid conſiderable attention to her navy, which has however been crippled in the recent warfare with England. The ſhips of the line can ſcarcely now be computed at more than fifty. Army. Navy.

The revenue of Spain may be calculated, as is believed, at five millions and a half ſterling money; ſo that each perſon pays ten ſhillings to government for protection. In France, under the old government, each perſon paid near twenty ſhillings; in England at preſent ſixty ſhillings. For the nature of the taxes the tables publiſhed by Mr. Townſend may be conſulted. The expenditure now equals, or exceeds the income; and the national debt gradually enlarges. The beſt judges of the ſubject infer that the colonies do not yield above one million ſterling, excluſive of the duties, a great part being conſumed in the expences of the government of thoſe diſtant regions.* Revenues.

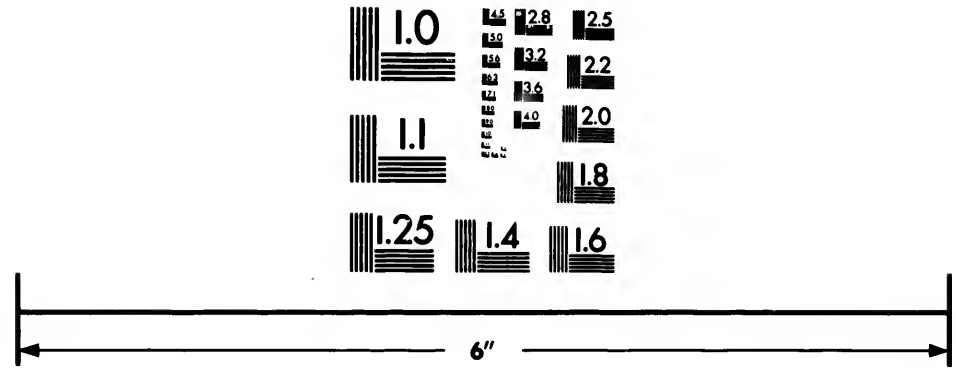
The political importance and relations of Spain were formerly deeply impreſſed on moſt regions of the globe. But exhauſted by idle wars of Political Importance and Relations.

* It is aſſerted that the ſubalterns publiſh exaggerated accounts of the revenues. The gabel is one of the moſt productive; and the clergy pay about fifteen millions of rials. Within theſe twenty years the expences exceed the receipts; and the debt, which is always augmenting, is computed at ſeven hundred millions of livres. MS. notes. The debt may be fifty millions ſterling.

Bourgoing computes the revenues of Spain at 616,295,657 rials, ii. 30. He ſuppoſes the money in circulation to be 80,000,000 of dollars, ii. 64. The common rial he eſtimates at five ſous of France, the dollar being computed at twenty rials.

ambition

IMAGE EVALUATION TEST TARGET (MT-3)



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POLITICAL IMPORTANCE, &c.

ambition or avarice, this fertile kingdom has become almost a cypher in European policy. Setting aside Portugal, which promises to be speedily united, the position of Spain secures her from any invasion, except on the side of France; and it becomes therefore the insuperable interest of this exhausted state to cultivate amity with her powerful neighbour, which must maintain an unavoidable and supreme ascendant, from geographic position and relative force. On the other hand the distance and importance of the Spanish colonies render a war with England the greatest calamity that can befal, as that power, enjoying the unlimited dominion of the ocean, can inflict dreadful wounds on the commerce and colonies of Spain. Such seem to be the sole hinges of Spanish polity, though ancient fame, and connections with the royal families of more potent states, secure some degree of deference to her councils and mediation.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs. — Language. — Literature. — Education. — Universities. — Cities and Towns. — Edifices. — Roads. — Inland Navigation. — Manufactures and Commerce.

MANNERS AND CUSTOMS.

IN speaking of the religion of Spain one of the most striking of the national customs and manners has been already mentioned, namely the common practice of adultery under the mask of religion. This disgrace, which is confined to the Catholic system, is said to have been transplanted from Italy, where love and devotion are as warm as in Spain. But the Italian *cicisbei* are more commonly gentlemen; while in Spain the cortejos, though commonly military officers, are sometimes monks and ecclesiastics; and the vice becomes flagrant beyond conception, as it is practised by those very men who ought to exhibit examples of pure morality. It may perhaps be asserted that the Roman Catholic system in the south of Europe is the only superstition in the universe which has, at any period, necessitated the practice of vice; thus confirming the maxim that the corruption of the purest and best system is always the worst. Were the father of their faith, St. James the apostle, again to visit Spain, he would certainly begin with preaching the christian practice, as if the very idea of christianity had perished; and his first duty would be to convert the ecclesiastics.

Exclusive of this vice, the Spanish character is highly respectable, for integrity and a long train of virtues. Conscious of an upright and noble mind, the respect which a Spaniard would pay to those qualities in others, is often centered in himself, as he is intimately sensible that he possesses them. This self-respect is nearly allied to pride; but it is the pride of virtue, which certainly ought not to humble itself before

MANNERS AND CUSTOMS.

vice and folly. From the ſame principle ariſes an exceſs of ceremony, at leaſt as laudable as the oppoſite extreme of nudity and impertinence, to which ſome modern fanatic philoſophers would reduce human nature, or in other words brutalize the ſpecies. Temperance is a virtue which the Spaniard ſhares with other ſouthern nations, for wine is ſo inflammatory in regions expoſed to the heat of the ſun, that inſtead of an agreeable warmth, and a flow of ideas, it would produce fever, miſery, and madneſs. In theſe countries the body is ſo much exhauſted by the influence of heat, that the ſieſta, or ſhort ſleep in the middle of the day, becomes a neceſſary reſource of nature, and is by habit continued even in the winter.

The chief defect in the character of the Spaniſh nobility and gentry is, their averſion to agriculture and commerce. Inſtead of thoſe beautiful villas, and opulent farms, which enrich the whole extent of England, the Spaniſh architecture is almoſt confined to the capital, and a few other cities and towns. The metropolis is however their chief element, by traditionary cuſtom, which aroſe like others from neceſſary cauſes; as in former turbulent periods their preſence at court was conſidered as the ſole pledge they could give of their duty and affection to the monarch. Now that long authority, and multiplied diſtinctions, have elevated royal families far above any competition with the great nobles, it would be patriotic in the ſovereign to order them to build detached villas, and to eſtabliſh their chief reſidence in them; a maxim of prudence not unknown to James the firſt of England, who uſed to adviſe the great men not to haunt the court, but their own eſtates, where their money might be ſpent among the tenants who ſupported their opulence; adding a ſimilitude that a ſhip in a fleet at ſea appeared nothing, but in a river became an object of great importance. Till this event take place, and till farm houſes are ſcattered over the kingdom, it will be abſolutely impoſſible for agriculture to flouriſh in Spain. To import German colonies, as has been done in the Sierra Morena, is to begin at the wrong end, and to ſuppoſe that the poor can ſet an example to the rich. If, by any wiſe reverſion of prejudices, idleneſs, in whatever claſs of men, could be branded as infamous, and the diſgrace extended to opulent vagabonds, we might then be led to hope that

that ſome thouſands of Hidalgos, or ſons of ſomething, ſhould become the more laudable ſons of their own works, and contribute by trade and agriculture to promote at once their own fortunes, and the public proſperity. Theſe remarks chiefly apply to the central provinces, for thoſe in the north, Biſcay, Aſturias, Gallicia, where the Hidalgos are moſt numerous, are the moſt induſtrious ſave thoſe on the Mediterranean.

MANNERS AND CUSTOMS.

Since the acceſſion of the houſe of Bourbon, a ſlight ſhade of French manners has been blended with the Spaniſh gravity. But faſhions have here little ſway; and the prohibition of ſlouched hats and long cloaks led to a ſerious inſurrection. The former prohibition was however continued, and is ſalutary, as the hidden countenance occaſioned many nauſeous cuſtoms, and even frequent aſſaſſinations. All viſits are underſtood to be paid to the miſtreſs of the houſe, the extreme gallantry of the men having reduced them to cyphers. When the Spaniſh ladies go to maſs, which is a common occaſion of their being ſeen abroad, they attire themſelves in a *baſquina*, black ſilk petticoat, and the *mantilla*, now a kind of veil, is often arranged with ſingular eaſe and grace. The houſes of the great are not diſpoſed with the moſt elegant and commodious architecture; but are ſo large that Mr. Townſend aſſigns 400 bedchambers to the Duke of Alba's palace, where all the ſuperannuated ſervants, with their wives and children, were lodged; their wages being computed at 1000l. ſterling a month. The cottages and inns are, on the contrary, miſerable: but the dreſs and manners of the lower claſſes vary much in different provinces; and for a living picture of them the reader may conſult the immortal work of Cervantes.

A late ingenious traveller gives the following obſervations:

"It is true that in Spain women were formerly in a ſtate of the moſt abject ſlavery, inſomuch that ſince the general civilization of Europe Spaniſh jealouſy has become proverbial; but in progreſs of time the manners of Spain, running from one extreme to the other, are almoſt become more free than in any other country. Women pay and receive viſits, form their tertullas at will, go to public fêtes without conſulting their huſbands, ſpend the income of their dowries as they pleaſe, and

 demand

MANNERS AND CUSTOMS.

demand beſides a certain proportion of pin-money, which is ſtipulated in their marriage articles. In a word, they not only know how to aſſert their rights, but enforce their pretenſions with the utmoſt rigour. They alſo combine together with a kind of eſprit de corps, by means of which the ſlighteſt infringement of common uſage is reſented as an attack or injury done to the whole ſex.*"

The amuſements of people of rank chiefly conſiſt in dancing and cards, and the theatre is much frequented, though the plays and muſic do not correſpond in excellence with the national refinement. The combats with bulls in the amphitheatres have juſtly been regarded as a ſtriking feature of Spaniſh and Portugueſe manners. That ſuch ſpectacles tend to familiariſe the people with bloodſhed, ſeems an idle theory, unwarranted by facts. Modern Italy has no gladiators, but numerous aſſaſſins; ancient Rome had ſcarcely one aſſaſſin, but whole armies of gladiators. Hardly to the moſt weak and diſeaſed fancy can theatrical repreſentation preſent any idea connected with real life; and it ſeems of no moment to the national character whether bulls be killed by butchers or by champions. A French theoriſt infers, from the bloodſhed in Engliſh tragedies, that the people are ſanguinary; whereas the very reverſe is the truth, and an Engliſh mob may deſtroy houſes, but never ſheds blood. Contraſt this with the innocent tragedies of the French, and the ſanguinary ſpirit of the populace, exhibited at ſuch diſtant periods, and from ſuch oppoſite cauſes. The chief actors in the bull feaſts are the picadors, who are mounted on horſeback and armed with lances, and the chulos on foot, who relieve and ſuſtain the former; but the chief perſonage is the matador, who enters amidſt the profound ſilence of the whole aſſembly, and coolly diſpatches the furious animal by a blow where the ſpinal marrow joins the head. The death is bloodleſs and inſtantaneous, and deſerves imitation, as humanity would wiſh to ſave pain to the animals ſlaughtered for food. Sometimes the bull is pierced in various parts with darts, to which ſquibs are faſtened, which being ſet on fire, the maddened animal ſtands pawing the ground, while he draws in and exhales volumes of ſmoke: ſometimes an American is introduced, who, after the manner of hunting the wild

* Fiſcher, 174.

bull

bull in his own country, throws a rope around the horns, and entangles the quadruped as in a net, then kills him with perfect ſafety. Manners and Customs.

The Spaniſh language is one of the three great ſouthern dialects which ſpring from the Roman; but many of the words become difficult to the French or Italian ſtudent, becauſe they are derived from the Arabic, uſed by the Moors, who for ſeven centuries held dominion in this country. The ſpeech is grave, ſonorous, and of exquiſite melody, containing much of the flow and formal manner of the Orientals, who ſeem ſenſible that the power of ſpeech is a privilege. Language.

The literature of Spain is highly reſpectable, though little known to the other countries of Europe ſince the decline of Spaniſh power. The Bibliotheca Hiſpanica of Antonio will completely ſatisfy the curious reader on this ſubject. Among the fathers of literature in this country muſt be named Iſidore of Seville, many of whoſe works are extant, and inferior in merit to few of that epoch. Lives of ſaints, and chronicles, are alſo found, as uſual, among the earlieſt productions; and ſucceſſive writers may be traced to the eleventh century, when they become numerous; but before briefly mentioning ſome Spaniſh authors poſterior to that period, it will be proper to recollect that Arabian learning flouriſhed under the Chalifs of Cordova, and produced many illuſtrious names well known to the Oriental ſcholar, as Aben Roe, or Averroes, Aben Zoar, Rhazes, &c.; nor muſt it be forgotten that Aben Nazan wrote a book on the learning and authors of Spain. On this ſubject the inquiſitive are referred to the work of Caſiri. Many Jewiſh authors alſo flouriſhed in this country. Literature.

In the eleventh century, as already mentioned, the Spaniſh authors began to increaſe in number, and the native language begins to appear. This was the epoch of the famous *Cid*, an Arabic term implying *lord*, Roderic Didac de Bivar, whoſe illuſtrious actions againſt the Moors were celebrated in contemporary ſongs, and by a long poem, written in the ſucceeding century; which alſo boaſts of many chronicles and much ſacred biography. After the thirteenth century, it would be idle to attempt to enumerate the crowd of Spaniſh authors, among which are Alphonſo the wiſe, who wrote the *Libro del Teſoro*, a treatiſe on the three parts of philoſophy, rational, phyſical, and moral;

LITERATURE.

and at whofe command were compiled the famous Alphonfine tables of aftronomy. Raymond Lully is faid to have written no lefs than 319 books: they are full of metaphyfical froth, and one book of real knowledge would outweigh the whole. In the fifteenth century appeared Juan de Mena, a poet of furprizing powers, and who unites the merits of Dante and Petrarca. Since the year 1500 fcarcely can a department of literature be mentioned, in which the Spaniards have not excelled; if we except natural philofophy, the progrefs of which has been checked by the inquifition. It would be unneceffary to repeat the well known names of Cervantes, Quevedo, Lopez de Vega, or other authors whofe works are known to all Europe. The hiftory of Mexico by De Solis has been celebrated as a compofition; but in facts it is defective and erroneous. The name of Bayer in learning, and of Feyjoo in general knowledge, have recently attracted deferved refpect: nor has the line of royal authors failed, an elegant tranflation of Salluft having been publifhed by Don Gabriel, fon of the king.

Education.

The rudiments of education in this country being chiefly imparted by antiquated methods, it cannot be expected that ufeful knowledge fhould be common. But the recent accounts of Spain have thrown fo little light on this topic, that it can only be generally underftood by comparifon with other catholic countries. It is however to be regretted that intelligent travellers have not lent more attention to this fubject, more important in its confequences than any form of government: nor would it be unufeful to know that practifed in Spain, in particular, as the reverfe muft be excellent.

Univerfities.

The univerfities, or rather academies, in Spain are computed at upwards of twenty; of which the moft noted is that of Salamanca, founded in the year 1200 by Alphonfo IX king of Leon, and afterwards regulated by Alphonfo the wife. The ftudents have, at former periods, been computed at 16,000, fufficient to darken the face of the earth; for the reign of Ariftotle in logic and natural philofophy, and of Thomas Aquinas in theology, continues unviolated, fo that a ftudent of the year 1800 may afpire to as much ignorance as one of the year 1300; and the progeny of dunces proceeds without end. In 1785 the number of ftudents was computed at 1909.[1] The fame antiquated

[1] Townfend, ii. 79.

teachers are received with implicit faith in the other univerſities, ſo that a more liberal education at ſchool muſt here be obliterated. UNIVERSITIES.

As a proper introduction to a brief account of the chief cities and towns of Spain, the following eſtimate is ſubjoined from an accurate author:[2] Cities and Towns.

Cities—Ciudades - - -	145
Borough towns—Villas - -	4,572
Villages—Lugones - - -	12,732
Hamlets—Aldeas - - -	1,058
Granjas—Farm houſes - - -	815
Cotos redondos—Parks or waſtes incloſed	611
Depopulated towns - - -	1,511
Pariſhes - - - -	18,972
Convents - - - -	8,932

Madrid, the royal reſidence, while Seville is eſteemed the capital of Spain, is of recent fame. Philip II firſt eſtabliſhed his court at Madrid; and the nobility, in conſequence, erecting numerous palaces, this formerly obſcure town began to aſſume an air of grandeur. The centrical poſition ſeems the chief advantage, for the environs can boaſt of little beauty or variety. The river Mançenares is in winter a torrent, but dry in ſummer: over it is an elegant bridge, which occaſioned a ſarcaſtic remark that the bridge ſhould be ſold in order to purchaſe water. This metropolis contains 13 pariſhes, 7398 houſes, 32,745 families, amounting to a population of 147,543.[3] The convents are 66; and there are fifteen gates of granite, many of which are elegant.* The chief is the Puerta de Alcala, of three arches, the central being 70 feet in height. The churches and monaſteries contain many noble paintings, and the royal palaces diſplay conſiderable magnificence. The new palace preſents four fronts, of 470 feet in length and 100 in height, enriched with numerous pillars and pilaſters. The foundation was laid in 1737, three years after the ancient palace had fallen a ſacrifice to the flames. The audience chamber is deſervedly admired, being a Madrid.

[2] Townſend, ii. 215. [3] Ibid. i. 253.

* Many of the new houſes are alſo of granite, which is brought from the diſtance of ſixteen or eighteen leagues. Fiſcher, 133.

double

Cities and Towns.

double cube of 90 feet, hung with crimſon velvet, and adorned with a ſumptuous canopy and painted ceiling. The prado is a ſpacious courſe, in which the great diſplay their elegant equipages. At Madrid are the royal manufactures of china, ſaltpetre, &c.; but the city has little trade, and chiefly proſpers by the preſence of the court, and confluence of the great, whoſe rents are remitted to the capital to the great injury of the kingdom at large.

Next in real importance to Madrid are the principal ſea-ports, which are enriched by commerce; while the cities in the interior decline from the want of agriculture and inland navigation. The commerce of America formerly centered at Seville, but was afterwards removed to Cadiz, a city which is ſuppoſed to contain about 70,000 ſouls.[4] The two cathedrals are grand; and there is an hoſpital which will contain 6000 patients. The hoſpicio, or general workhouſe, is an intereſting eſtabliſhment, containing more than 800 poor of all ages, who are here trained to induſtry.

Cadiz.

Malaga.

Malaga is eſteemed the ſecond port in the kingdom, and is alſo celebrated for excellent wines, the rich Malaga, the Mountain, ſo called from the hills which produce the grape, and the Tent or Tinto, ſo ſtyled from its deep red tinge. Malaga ſtands in a valley ſurrounded with hills, the houſes high, the ſtreets narrow and dirty. Inhabitants about 40,000: the cathedral begun in 1528 is not yet finiſhed; the convents are 25, but of ſmall account.[5] The city ſwarms with thieves and mendicants. The municipal government reſts with a corregidor or mayor, appointed by the crown; but the regidors or aldermen are hereditary. There are alſo two ſyndicos, or tribunes to protect the people.

Barcelona.

Towards the S. E. is the third moſt conſiderable port of Spain, that of Barcelona.[6] The ſtreets are narrow and crooked; the churches rather rich than beautiful. The hoſpicio contains about 1400 induſtrious poor, and there is a houſe of correction which ſometimes includes even women of rank, if guilty of drunkenneſs or other low vices. The inhabitants of Barcelona are computed at more than 100,000; and induſtry prevails here, being a native virtue of the Cata-

[4] Townſend, ii. 374. [5] Ib. iii. 10. &c. [6] Ib. i. 106.

lonians:

Cities and Towns.

lonians: chief manufactures, ſilk, cotton, and wool, excellent fire-arms and cutlery; the chief imports, corn, fiſh, and woollen goods; exports, wine, brandy, cloth, and leather. During peace it is ſuppoſed that 1000 veſſels enter this port; of which half are Spaniſh, 120 French, 100 Engliſh, and 60 Danes. Barcelona ſtands in a plain open to the S. E. but protected by hills on the north and weſt, being a healthy and delightful reſidence; but the eaſt wind commonly brings fog, and produces ſuch irritability that the beſt friends at ſuch periods rather wiſh to avoid each other.

Corunna.

Along the northern ſhores of Spain there are few harbours of any note. The moſt remarkable is that of Corunna, by our mariners ſtyled the Groyn. The harbour is large and ſafe; the town is of a circular form; but the poverty of the ſurrounding province of Galicia affords few reſources for trade, and many of the natives are diſperſed over Spain and even Portugal, as day labourers and ſervants, being univerſally eſteemed for their probity and fidelity.

The chief inland cities of Spain ſhall be briefly reviewed, beginning from the north. Oviedo and Leon are now inconſiderable, and only boaſt their ancient fame, as ſucceſſive capitals of Spaniſh royalty, when ſtruggling againſt the Moors. The cathedral at Leon is admired for its elegant lightneſs.

Pampelona.

Pampelona, the capital of Navarre, is more remarkable for the learning of ſome of its prelates, than for any other circumſtance. The inhabitants are about 5000. Burgos, the ſee of an archbiſhop, retains veſtiges of former opulence. Valladolid, in the ſame province of old Caſtille, contains ſome woollen manufactures, and many goldſmiths and jewellers.

Saragoſſa.

Saragoſſa, the chief town of Arragon, is the ancient Cæſarea Auguſta, and diſplays many rich churches and convents.[7] The univerſity contains about 2000 ſtudents. There are no manufactures, though it is to be hoped that theſe will be encouraged by the great canal of Arragon, projected, like other Spaniſh works, on a moſt magnificent ſcale, the propoſed length of about 250 Engliſh miles, from the mouth of the Ebro to St. Ander in the weſtern extremity of Biſcay, thus uniting the Mediterranean with the Atlantic.

[7] Townſend, i. 205.

Cities and Towns. Toledo.

On the ſouth of Madrid firſt occurs Toledo, a city of conſiderable fame, and remarkable ſituation, for the river Tajo, or Tagus, paſſing between two mountains of granite, almoſt ſurrounds one of them, on which is placed the city, riſing like a cone.[8] Toledo was formerly the royal reſidence; and contains a grand palace, built in the reign of Charles V. The manufacture of arms was long famous, and has been recently revived: the archbiſhoprick is computed at 90,000l. annually; but the inhabitants, once calculated at 200,000, are now reduced to 25,000.

Badajos.

Badajos, in Eſtramadura, is remarkable for its poſition on the very confines of Portugal, and is the ſee of a biſhopric. In the ſouthern

Seville.

provinces appears Seville, famous till the year 1720, as the mart of American trade. The inhabitants are computed at 80,000; and the churches and convents are opulent and beautiful.* The chief manufactures ſilk, and recently ſnuffs, a royal monopoly, not only the common Spaniſh, but rappee, as it was found that the latter was ſmuggled from France. The tobacco employs 220 manufacturers, who are ſtrictly examined and guarded. Seville is eſteemed the chief *city* of Spain, Madrid being only a *town* diſtinguiſhed by the royal reſidence.[9]

Murcia.

Murcia, the capital of the province ſo called, is of conſiderable account, and ſituated in one of the moſt beautiful vales in Spain.[10] The inhabitants are computed at about 80,000, more probably 60,000. There is a beautiful bridge over the Segura; and the cathedral is lofty, but cannot boaſt of internal opulence or beauty.[11]

Granada.

Granada has been long celebrated as the paradiſe of Spain, though the ſouthern provinces be in general unhealthy. This city ſtands in a vale bounded by hills, beyond which to the ſouth is the Sierra Nevada, ſo called becauſe the mountains are covered with perpetual ſnow. The inhabitants ſuppoſed to be 80,000; the Mooriſh palace here has been already deſcribed; and adjoining is a palace erected by Charles V.

[8] Townſend, i. 303.

* The author was favoured at Paris with the peruſal of ſome manuſcript notes concerning Spain by a diplomatic man of good information. In theſe notes the population of Seville is eſtimated at 70,000, Barcelona at 90,000, Toledo at 20,000.

[9] Dillon, 432. But the population of Madrid and Barcelona is far ſuperior.

[10] Townſend, iii. 150. [11] Ibid, iii. 55.

The

The cathedral and convents contain excellent pictures by Spanish masters. The municipal government is in a corregidor, and twenty-four regidors. There are beautiful public walks; and the environs are delightful and well cultivated.* Cities and Towns.

The most remarkable edifices of Spain are the cathedrals of the several sees, and the churches belonging to opulent convents. The houses of the nobility are confined, with few exceptions, to the capital and other cities, instead of adorning the country at large as in England. This circumstance however tends, in Spain and Italy, to impress a stranger with erroneous ideas concerning the abundance of works of art in these countries; while the seeming opulence arises in great part from their being concentrated in particular spots, instead of being diffused in distant villas. The palace and monastery of the Escurial have been described at great length by many travellers. It is seated in a deep recess, at the foot of high mountains; and was built by that bigot Philip II in the strange form of a gridiron, the instrument of the martyrdom of St. Lawrence, upon whose anniversary the Spaniards gained the victory of St. Quintin. The convent is 740 feet by 580; and the palace forms the handle of this imaginary gridiron. The paintings are excellent and numerous; and the vault containing the royal tombs is grand and impressive. But the palaces of Aranjuez and St. Ildefonso are greater favourites with the court. The gardens of the former, watered by the Tajo, are laid out in a just and natural taste. St. Ildefonso is a summer residence, exposed to the north; and being built on a rocky soil is computed to have cost six millions and a half sterling. The Pardo, another palace, stands in the midst of a large forest. Edifices.

* Gibraltar, so called from a Moorish or Arabic denomination, signifying the mountain of Tarik who conducted the Moors into Spain, stands on the west side of a rocky mountain, called Calpe by the ancients: and to the west of the town is a large bay. In 1462 it was taken from the Moors; and in 1704 fell into the hands of the English. The siege during the American war is of fresh and celebrated memory. The inhabitants of the town are about 5000; and the garrison generally amounts to as many. The number and strength of the military works, and the vast galleries opened in the calcareous rock, excite admiration. There is a stalactitic cave, that of St. Michael; and bones are found in the rock, which seem to have fallen into the cavities, where they are enveloped in the exuding petrifaction. The fortress, in the opinion of most military men, is absolutely impregnable.

INLAND NAVIGATION.

Colonies proved the ruin of Athens; and the attention paid to foreign colonies is always detrimental to the parent ſtate. This political axiom may moſt juſtly be applied to Spain, which has in fact been exhauſted and impoveriſhed by grand and rich colonies. Hence the natural advantages of the country have been ſacrificed to commercial ſpeculations; and the miſer ſtarves amidſt accumulated wealth. In his able work, the beſt yet publiſhed, concerning Spain, Bourgoing has given a detailed account of the canals of this country. They are generally on a moſt magnificent ſcale, and are of courſe objects of long time and much expence. One was to paſs from Madrid to join the Manzanares with the Tagus, and thus facilitate the communication between the capital and Aranjuez, but only two or three leagues are finiſhed.* That of Caſtile, begun long ago, is almoſt abandoned. In 1784, the government adopted the project of a canal from the mountains of Guadarama to the Tagus, thence to Guadiana, and to end at Guadalquivir above Andujar, which would of courſe enliven all the centre of Spain. It is ſuppoſed this canal will be carried into effect. At preſent the chief canal is that of Arragon, paſſing not far from Saragoſſa, where there are magazines for various articles tranſported, and ſix beautiful locks at no great diſtance. The moſt expenſive part is where the canal is conducted above the river Xalon for a ſpace of 710 fathoms. Near Gallur, a village on the Ebro, the canal is conducted through conſiderable heights, but this part is the work of Charles V, who began the canal of Arragon, though it was not reſumed till 1770. Afterwards entering the kingdom of Navarre, near Formigales, the Ebro joins the canal, or rather feeds it by eleven apertures in a pier, 118 fathoms long and 17 broad. Here are ſeveral handſome edifices finiſhed in 1787. The whole reflects the higheſt honour on Spaniſh induſtry and magnificence, and the utility of the canal has already been atteſted by the experience of twenty years; in 1792, it yielded about 2,000,000 rials, and the value of the adjoining eſtates has been raiſed in the ſurpriſing degree of fifty to one. Yet this grand canal is ſtopped about a league below Saragoſſa, and is even neglected! It was to have entered the Ebro at Saſtago, but in 1793, of thirty-four locks,

* Bourgoing, i. 324.

only

only ſix were finiſhed: and the projected length was of 26 Spaniſh leagues, or 104 B. miles, from Tudela to Saſtago, where the Ebro becomes navigable, the leaſt depth being nine feet, and the largeſt barks may carry 2700 quintals.* But the central canal would be of ſtill more conſequence; and if the example of England were followed, fertility and trade might be diffuſed in all directions through the inland and barren provinces of Spain. This object may even be recommended as of all others the moſt worthy of the attention of the government. INLAND NAVIGATION.

The manufactures of Spain are conſiderably checked by the royal monopolies, which extend to the following articles:[u] Manufactures and Commerce.

Broad cloth, at Guadalajara and Brihuega.
China, at the palace of the Buen Retiro.
Cards, at Madrid and Malaga.
Glaſs, at St. Ildefonſo.
Paper, in Segovia.
Pottery, at Talavera.
Saltpetre, at Madrid and various other places.
Stockings, at Valdemoro.
Swords, at Toledo.
Tapeſtry, at Madrid.
Tiſſue, at Talavara.

The king has alſo the monopoly of brandy, gunpowder, lead, quickſilver, ſealing wax, ſalt, ſulphur, and tobacco. Moſt of the royal manufactures may be regarded as monopolies; no private capital being able to vie with the treaſury. It is poſſible that the firſt intentions were laudable; to ſet an example to the nobility of the advantages of induſtry; but in this reſpect they have failed, and the conſequences have added to the national diſtreſs. Many manufactures are however conducted in Spain with great ſpirit and aſſiduity; and any failure muſt not be imputed ſo much to the indolence of the people, as to the prejudices of the great, and the inquiſitorial power of the eccleſiaſtics, which cramps genius and invention of all kinds, and conſtrains the mind to the ſame perpetual circle. Spain ſupplies wines, oil, fruits, ſilk, leather, broad cloth, and other articles to many European coun-

* Bourgoing, iii. 45.
[u] Townſend, ii. 240. The famous *vicuna* cloth is only made at Guadalaxara. Bourg. i. 114.

MANUFACTURES AND COMMERCE.

tries; but her chief trade is with her own colonies in America. The ſoil of Spain is exuberant in the production of ſaltpetre; and the barilla, uſed in making glaſs, has been long celebrated. This ſpecies of potaſh is procured by burning ſeveral vegetables found on the ſhore of the Mediterranean near Carthagena.[13] The region which produces the greateſt abundance extends about ſixty leagues in length and eight in breadth. Spain is ſuppoſed not to gain conſiderably by her intercourſe with her colonies, for the gold and ſilver imported flow like water from the parent rock into the vales, naturally proceeding towards countries where labour is cheaper, and which ſupply Spain with neceſſaries in return for the precious metals.

In the year 1784 the exports from Spain to America were thus computed in pounds ſterling:[14]

	Spaniſh Produce.	Foreign Produce.	Total Produce.
Cadiz - -	1,438,912	2,182,531	3,621,443
Malaga -	196,379	14,301	210,680
Seville - -	62,713	30,543	93,256
Barcelona -	122,631	21,240	143,871
Coruna -	64,575	39,962	104,537
Santander -	36,715	90,173	126,888
Tortoſa -	7,669	289	7,958
Canaries -	24,974	- -	24,974
Gijon - -	4,281	10,190	14,471
	£.1,958,849	£.2,389,229	£.4,348,078

The duties were computed at 170,800l.

The imports from America to Spain were, at the ſame time thus, eſtimated in the ſame money:

	In Money and Jewels.	In Merchandiſe.
Cadiz -	8,297,164	2,990,757
Malaga -	- -	18,605
Barcelona -	102,140	91,233
Corunna -	741,283	90,001
Santander	40,843	100,974
Canaries -	109,807	52,366
	£.9,291,237	£.3,343,936

[13] Townſend, iii. 131. [14] Ibid, ii. 415.

The

The whole imports therefore exceeded twelve millions and a half: the duty amounted to more than half a million.* MANUFACTURES AND COMMERCE.

* M. Bourgoing informs us, ii. 197, that the customs which in 1778 were 6,761,291 rials arose in 1788 to 55,456,949, so beneficial had been the effects of the regulation in 1778 for the greater freedom of commerce. In 1791, ib. 208, there had arrived in Spain from Peru and Mexico 21,000,000 of dollars.

For a singularity in recent Spanish commerce, the history of the Company of the Philippines, the same author may be consulted, tom. ii. p. 249, &c. This company was established in 1784, with a stock of 8,000,000 of dollars, and carries a trade round the globe, passing by Cape Horn and returning by the Cape of Good Hope. But this extent in itself may probably prove ruinous.

CHAPTER. IV.

NATURAL GEOGRAPHY.

Climate and Seasons. — Face of the Country. — Soil and Agriculture. — Rivers. — Lakes. — Mountains. — Forests. — Botany. — Zoology. — Mineralogy. — Mineral Waters. — Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of Spain has been deservedly praised, as equal if not superior to that of any country in Europe; but in the southern provinces the heat is insalubrious, and malignant fevers sometimes sweep off great numbers. This disaster probably originates from the neglected state of the country, from stagnant marshes which might, if properly drained, supply running streams and verdant meadows. The S. E. wind from Africa, called Solano, has such inflammatory effects that it is said more murders are then committed during three days, than throughout the rest of the year.[1] The chains of mountains which pervade Spain at different intervals, from E. to W., seem to temper the climate, and supply cooling breezes. In the South the sea breeze, beginning about nine in the morning and continuing till five in the evening, agreeably diversifies the warmth of the summer; and in the northern provinces the severity of winter is allayed by the proximity of the ocean, which generally supplies gales rather humid than frosty.

Face of the Country.

The face of the country is in most seasons delightful, abounding with excellent and fragrant pasturage, vineyards, and groves of orange trees; and the hills clothed with wild thyme and other odorous plants. The rivers and streams are numerous; and the chains of mountains afford a grand variety to the prospect.

Soil and Agriculture.

The soil is generally light, and reposes on beds of gypsum or plaister of Paris, itself an excellent manure. "The common course of

[1] Dillon, 308. Townsend, &c.

husbandry[2] about Barcelona begins with wheat; which being ripe in June is immediately succeeded by Indian corn, hemp, millet, cabbage, kidney beans, or lettuce. The second year these same crops succeed each other as before. The next year they take barley, beans, or vetches; which coming off the ground before Midsummer, are followed, as in the former years, by other crops, only changing them according to the season, so as to have on the same spot the greatest possible variety." Wheat produces ten for one; but in rainy seasons fifteen. The same intelligent author informs us that near Carthagena the course is wheat, barley, and fallow.[3] For wheat they plough thrice, and sow from the middle of November to the beginning of December; in July they reap from ten to one hundred for one, as the season happens to be humid. The Huerta, or rich vale of Alicant, yields a perpetual succession of crops. Barley is sown in September, reaped in April; succeeded by maiz, reaped in September; and by a mixed crop of esculents which follow. Wheat is sown in November, and reaped in June; flax in September, pulled in May. In the vale of Valencia wheat yields from twenty to forty; barley from eighteen to twenty-four; oats from twenty to thirty; maiz one hundred; rice forty. In the more southern provinces the land is almost equally fertile: and the sugar-cane is cultivated with success near Granada. The Spanish plough is generally light, and is drawn by oxen with the yoke over the horns; the most proper and natural mode, as the chief strength of the animal centres in the head. Agriculture is greatly impeded in Spain by the superior attention paid to the large flocks of sheep, which are authorised by a special code, the Mesta, to travel from one province to another, from Andalusia to Arragon, as the season presents pasturage in the vales, or on the mountains. The Merino sheep, or flocks thus privileged, are computed at 5,000,000; and one nobleman has sometimes 40,000. The fleece is esteemed double in value to that of other sheep: but the checks given to agriculture by such privileges, unknown to all other countries, are incalculable.*

Soil and Agriculture.

[2] Townf. i. 179. [3] Ibid. iii. 134.

* All the provinces of Spain produce wine. The only sugar plantations are near Motril on the coast of Malaga. Wood is scarce in the two Castiles, Estremadura, and Leon. The cables of the Spanish vessels are often made of *esparto* from Murcia. MS. notes.

The old Sherry wine, *Xerez seco* (Fischer, 314), is the Sherry *sack* of Shakspere.

Among

RIVERS. Ebro.

Among the chief rivers of Spain may be named the Ebro, which anciently conferred an appellation on the country. This noble ſtream riſes in the mountains of Aſturias, in a ſmall vale E. of Reinoſa, and purſuing its courſe to the S. E. enters the Mediterranean ſea, after having run about 380 G. miles. The other rivers running to the eaſt are of leſs importance, as the Guadalavir, the Xucar, and the Segura, which enlivens the fertile vales of Murcia. Towards the weſt occurs the Guadalquivir, the ancient Bætis, which gave name to the province. This river originates in the Sierra Morena, and flows into the gulph of Cadiz, after a courſe of near 300 G. miles. The Guadiana riſes in the N. ſide of the Sierra Morena, according to Spaniſh authors, though the chief ſources ſeem rather to be in the mountains of Toledo: it purſues a part of its courſe through Portugal, and falls into the gulph of Cadiz, after a circuit nearly equal to that of the Ebro. But the chief river of Spain and Portugal is the Tajo, or Tagus, which riſes on the weſt of Arragon, near Albarracin, in a ſpring called Abrega,* and holds a courſe of about 450 G. miles. The Douro ſprings near the ruins of ancient Numantia; and its courſe may be computed at 350 G. miles. The Minho riſes in the mountains of Galicia; and is more remarkable as forming a part of the boundary between that province and Portugal, than for the length of its circuit, which does not exceed 160 G. miles. Many other ſtreams pervade the northern provinces, but not of ſufficient importance to be here commemorated.

Guadalquivir.

Tajo.

Douro.

Minho.

Lakes.

The lakes of Spain are ſo few, and of ſuch ſmall extent, that they ſcarcely deſerve notice. There is a ſingular ſeries of ſmall lakes in the S. E. of New Caſtile, to which ſome aſſign the ſource of the Guadiana.

Mountains.

The Spaniſh mountains are arranged by nature in ſeveral diſtinct chains. The moſt northern is regarded as a continuation of the Pyrenees, paſſing on the S. of Biſcay and the Aſturias into Galicia. This chain is diſtinguiſhed by different names, as the mountains of Biſcay, the Sierra of Aſturias, and the mountains of Mondonedo in Galicia. It is alſo known by the names of the mountains of Santi-

* Near the Sierra Blanca, eſteemed the higheſt ſituation in Spain, as the Guadalaviar runs into the Mediterranean. Dillon, 208.

liana, of Vindo, and of the mountains of Oca.[4] If we except the Alps, Pyrenees, Apennines, and other chains in countries civilized at an early period, and accuſtomed to general and ſcientific views, there is ſcarcely a range of mountains diſtinguiſhed by an uniform term, though ſo neceſſary in geographic elucidation. It muſt alſo be here obſerved that the term *Sierra*, peculiar to Spain, implies a chain of mountains whoſe ſucceſſive peaks preſent the reſemblance of a *ſaw*. The gypſeous and argillaceous mountains of this country rarely exhibiting any ſupreme elevation, like thoſe in the granitic chains, naturally ſuggeſted this ſingular appellation. MOUNTAINS.

The ſecond chain of Spaniſh mountains extends from near Soria on the N. E., and purſues a S. W. direction towards Portugal. This chain is called that of Urbia, or Guadarama; and alſo the *Montes Carpentanos*.* The third is that of Toledo, or Guadalupe, running nearly parallel with the laſt. Theſe two central chains ſeem to contain great quantities of granite.

Next towards the S. is the Sierra Morena, or Brown Mountains which are followed by the moſt ſouthern ridge, that of the Sierra Nevada.

On the eaſt there is a conſiderable chain, which connects the two central ridges, and advances towards the Mediterranean in the north of Valencia. There are alſo ſeveral conſiderable ranges of hills in this part of the kingdom, generally running from N. to S.

A remarkable ſolitary mountain, not far from Barcelona, muſt not be omitted. At a diſtance Montſerrat appears like a ſugar-loaf; but on a nearer approach ſeems jagged like a ſaw, with pyramidal rocks: it is compoſed of farcilite or pudding ſtone, formed of limeſtone gravel united by calcareous cement; and is of ſuch a height that from its ſummit may be diſcerned the iſlands of Majorca and Minorca, at the diſtance of 50 leagues.[5] The cicumjacent region is of argillaceous ſchiſtus, with clay Montſerrat.

[4] Journal des Mines, An. v. 391.

* Dillon, p. 115, ſays the mountains, dividing the two Caſtiles, are called thoſe of Guadarama. The northern chain might be called that of Oca, the other that of Toledo or Villuercas: the eaſtern ridge that of Burgos.

[5] Townſ. i. 189. Cape de Gata is about twenty miles in extent. One hill is of brown baſalt; another preſents ſapphires and alabandines, as Launoy, a French naturaliſt, who viſited it, informed the author.

Mountains. and ſand. As the Pyrenees are chiefly calcareous, the pebbles, even to a remote diſtance, are of the ſame nature; and this hill ſeems to have originated in ſome unaccountable manner, from materials ſwept down by primeval waters from the Pyrenees; as thoſe near Oban in Scotland, from the granitic chain in that country: the only difference being that of the materials, which compoſe the farcilite, in the one inſtance calcareous, and in the other ſiliceous. Not far from Montſerrat, near the village of Cardona, is a hill three miles in circumference, which is one maſs of rock ſalt; uſed in the dry climate of Spain for vaſes, ſnuff boxes, and trinkets, like our Derbyſhire ſpar.

Pyrenees. The Spaniſh ſide of the Pyrenees has not been accurately examined; and as the French mineralogiſts have amply illuſtrated the part belonging to France, an account of theſe mountains has been given in the deſcription of that country. In the want of a general and ſcientific account of the Spaniſh mountains, a few notices muſt ſuffice, extracted from different parts of Mr. Townſend's travels. According to that intelligent obſerver the northern ſide of the Pyrenees is chiefly calcareous, ſurmounted with argillaceous ſchiſtus; but the ſouthern is granite, and of courſe barren.[6] The hills to the ſouth of Gerona are alſo granitic. The higheſt ridge in Spain, near Daroca, whence originate the Tajo and the Ebro, ſeems compoſed of argillaceous ſchiſtus, and freeſtone, probably reſting on granite.[7] Near Anchuela the mountains are limeſtone with ſhells; and ſometimes contain beds of red gypſum with cryſtals of the ſame colour. In general gypſum is as abundant in Spain, as chalk is in England; and the gypſum produces cryſtals of ſea ſalt and Epſom ſalt, and abundance of nitre. The mountains on the north of Madrid, forming part of the central chain, are granite.[8] Thoſe to the north of Leon chiefly marble, or limeſtone, on a baſis of argillaceous ſchiſtus, riſing in bold and rugged rocks, which afforded a barrier to the remains of Spaniſh liberty. In returning towards the S. the ſoil of La Mancha is ſandy, the rock gypſum. The higher regions of the Sierra Morena are granite; the lower argillaceous ſchiſtus, with gypſum and limeſtone. The granite is of two kinds, the red and the white.[9] Near Cordova

[6] Townſ. i. 89. [7] i, 219. [8] i. 356. ii. 107. [9] ii. 290. 297.

the

the higheſt hills are covered with rounded maſſes of granite, grit, and limeſtone. Near Malaga are branches of the Sierra Nevada, or ſnowy chain, an appellation which might alſo be extended to the central range between Old and New Caſtile, which, according to Mr. Townſend, might at ſome times be viſible at the diſtance of 100 miles: theſe branches preſent limeſtone and marble, ſurmounted by argillaceous ſchiſtus. Near Alhama S. E. of the city of Granada, are found rocks, which on a baſis of ſhingle or round gravel, preſent ſandſtone with ſhells, ſurmounted with farcilite; but in general the rocks are gypſeous, with ſtrata of the ſame ſubſtance cryſtallized. Mr. Townſend[10] ſuppoſes that the power of the ſun contributes to impregnate chalk with vitriolic acid, thus forming gypſum. The S. E. part of Spain ſeems equally calcareous, and the cathedral of Murcia is built with piſolite, a ſort of freeſtone reſembling the roe of fiſh. The aventurine is found in the mountain of Gata, towards the frontiers of Portugal; the Cape de Gata preſents alſo ſome ſingularities, and appears to ſome travellers to have been volcanic. Mountains.

Spain contains many foreſts, or rather chaces, for trees are rare, partly ariſing from the want of cultivation, partly reſerved for the royal pleaſures of the chace; as that of the Pardo, which extends near thirty miles in length, but barren of trees; ſome of the foreſts are haunted by ſmugglers, and banditti, who raiſe contributions from the unwary travellers, and even murders are not unfrequent. Foreſts.

Although the great promontory ſouth of the Pyrenean mountains is divided by its political intereſts, into the independent governments of Spain and Portugal, yet the diſtribution of the different kinds of ſoil, and natural products, is ſo little conformable to the territorial diviſion, that an account of the botany of either country muſt neceſſarily include the great outlines of the other: it will therefore ſave much repetition to unite the two kingdoms in a general ſketch of the botany of the whole promontory.* Botany.

[10] iii. 49. 52.

* Quere, Flora Eſpanola-Löfling, Iter Hiſpanicum.—Vandilli, Floræ Luſitanicæ Specimen.—Dillon's Travels.—Link's Travels.

Botany. Spain, including by this term the whole country south of the Pyrenees, may be divided according to its botany into the sea-shore; the high mountains; the lower ones; the arable lands; the grazing tracts and marshes along the rivers; and the vicinity of Lisbon and Oporto.

The sea-shore of Spain presents fewer peculiarities than the interior; resembling for the most part in its vegetable productions the northern coasts of the Mediterranean: the flat sandy tracts are occupied by the pancratium maritimum, *sea daffodil;* festuca maritima, and elymus caput medusæ, two coarse kinds of grass; salicornia fruticosa, *shrubby glasswort*, and salsola soda and sativa; of the last of these there are extensive plantations in the neighbourhood of Alicant and Barcelona, for the purpose of procuring from its ashes the Spanish barilla, an alkaline salt of considerable purity, of which some thousand tons are every year manufactured, partly for foreign commerce and partly for the preparation of the fine Spanish soap. The rocks on the coast are chiefly calcareous, and abound with *samphire; tree violet; tragacanth vetch;* the majestic antirrhinum Lusitanicum; *caper bush;* and stipa tenacissima, the celebrated esparto grass, which, on account of its extraordinary toughness, is used for making ropes, mats, chair-bottoms, and, in short, all the articles included under the French term *sparterie.*

The high mountains of Spain being neither so lofty, nor in such large masses as those of Swisserland, are covered with snow only for a few weeks in the year; here therefore, and in the lower mountainous ridges that border the bay of Biscay, we find a number of plants familiar to the plains of the north of Europe; the finest timber trees in Spain are found in these elevated regions, and the English botanist might here almost think himself in his native country.

The long ranges, of moderate sized hills that occupy the greatest part of Spain consist either of extensive arid tracts of sand, of arenaceous sandstone, and ferruginous rubble forming the heaths; of dry calcareous districts forming the sheep-walks; or of moist rough granitic and marble ridges, with but a shallow soil forming the woodlands.

The Spanish heaths are gayer and richer with plants than those of any other European country; in some parts are thick woods of the *yew-leaved fir* and *stone pine*, in others are scattered groves of

of *cork trees;* here the traveller is regaled with the fragrance of numberless aromatic plants, the *maſtich thyme; ſpike lavender;* origanum heracleoticum; *common* and *Spaniſh ſage;* and *roſemary.* The golden bloſſoms of the *gorſe*, ulex Europæus, a plant chiefly found in England and Spain, and the crimſon, fleſh-coloured, and ſnowy flowers of the arboreſcent *heaths*, mutually heighten each other; now the ſtately growth of the juniperus oxycedrus, or phœnicea attracts attention, then the eye turns with delight to the humble dianthus caryophyllus, *clove July-flower*, glowing by its ſide; the elegant lithoſpermum fruticoſum entangles itſelf among thickets of dwarf-myrtle, and every ſpot of ſand or dry rock, forſaken by other vegetables, is adorned and perfumed by the ciſtus; of this plant there are no leſs than fourteen ſpecies natives of Spain, all of them eminently beautiful for their broad ſilken bloſſoms of pure white or yellow with deep crimſon eyes: the *laurel-leaved ciſtus*, is moſt frequent in Old Caſtile, but the commoneſt of all is the ciſtus ladaniferus, *gum ciſtus*, a moſt elegant and fragrant ſhrub from ſix to ſeven feet high, which occupies whole miles of dry rock, and on this account forms a very peculiar feature in the ſcenery of Spain. BOTANY.

The ſheep-walks are for the moſt part open downs with little ſhelter, except here and there a grove of cheſnut trees, or evergreen oaks; the turf differs eſſentially from that of the Engliſh ſheep-walks in containing very few ſpecies of graſs, being chiefly compoſed of the ſmaller papilionaceous plants.

The woodlands of Spain demand particular notice, in an account of its vegetable productions; we find here none of that noon-day night of ſhade that ſpreads ſuch an aweful ſolemnity over the receſſes of the German and Engliſh foreſts, the trees are neither ſo large nor is their foliage ſo ample; ſeveral of the calcareous ſummits are covered with cheſnut trees and box, but the great maſs of the woods conſiſts of the *evergreen ſweet oak*, this tree is about the ſize of a large pear tree, which it ſomewhat reſembles in its manner of growth; its leaves are lanceolate, green above and hoary beneath, curled and rather ſcanty; it produces large crops of ſweet acorns, which are extenſively applied to the fattening of hogs, and the nouriſhment of the peaſants: intermixed with theſe are the wild olive, the kermes oak, walnut and carob tree; the almond fixes itſelf in the

 crevices

Botany. crevices of the rocks along with the *sumach*; the laurel, the bay, the lauruſtinus and Portugal laurel attain the height of ſmall trees, and yield a cool and ſhady retreat even in the midſt of a Spaniſh ſummer.

Where the ground is ſufficiently deep and moiſt for cultivation and rich paſturage, a number of beautiful bulbous-rooted plants appear early in the autumn and ſpring, and give a peculiar gaiety at that time to the Spaniſh proſpects; two ſpecies of aſphodel, the ramoſus and ſiſtuloſus, may be ſaid in a manner to overſpread the whole country, many alſo of the following are ſcarcely leſs common: *yellow amaryllis; autumnal ſnow-flake; jonquil;* narciſſus tazetta, bulbocodium and ſerotinum; *cluſtered hyacinth; orange* and *martagon lily;* polyanthus tuberoſa, and *wild tulip.* Several ſtrong ſmelling umbelliferous plants are alſo natives of Spain, ſuch as *fennel;* ferula communis, which yields the gum ſagapenum; and ferula ferulago, from which galbanum is procured. The fallows and dry thickets abound with the *fan-palmetto; yellow lupin; ſpiked ſumitory; Spaniſh* and *white broom.* In the hedges, and by the ſhady road-ſides are found the *laurel, winged iris;* atropa mandragora; ſmilax aſpera; three ſpecies of *fox-glove; pæony;* and *common paſſion flower.*

Both Portugal and Spain are for the moſt part deficient in water, the rivers flow through rocky channels, and therefore there are few marſhes, and ſtill fewer bogs: the ſides of rivulets are adorned with the oleander, laburnum, tamariſk, and myrtle, which in theſe ſituations grow with unuſual luxuriance; with the iris pumila, cyperus longus and eſculentus, arundo donax, *Spaniſh reed,* and pinguicula Luſitanica.

The vicinity of Liſbon and Oporto, and of a few other towns on the coaſt, is remarkable in botany for a number of Indian, African, and American plants, which have gradually ſtrayed out of the gardens, and have become completely naturalized to the ſoil and climate; the hedges of the fields are not unfrequently formed entirely of the *American aloe,* and *Indian fig;* the rich ſoil on the bank of the Tagus glows with the ſplendid ſcilla hyacinthoides, the ornithogalum Arabicum, and the allium ſpecioſum; and the ſheltered groves and ſunny rocks of Belem preſent the ſtately magnolia; the *date palm;* a beautiful kind of cypreſs originally from Goa; tea-tree from China; *Cape jaſmine; ice plant,* and ſeveral others of the ſame genus from the Cape of Good Hope;

 and

and the fragrant myrica Faya, from Madeira. Of the eſculent plants and fruits cultivated in Spain and Portugal, beſides thoſe already mentioned, the following are the chief: *wheat* and *barley*; *rye* and *rice*, in ſmall quantities; *oats* ſcarcely at all; *maiz*; *Guinea corn*, *millet*; in conſiderable quantity; *ſweet potatoe*, *plantains*, *chick pea*, *lupin*, *Monk's beans*, dolichos catjang; all the varieties of *gourds*, *cucumbers*, and *melons*; *figs*; grapes, oranges, lemons, bergamot oranges, and all the finer fruits of our Engliſh gardens. Botany.

The glory of Spaniſh zoology is the horſe, which has been famous in all ages, probably originating from the barb, or beautiful and ſpirited ſteed from the north of Africa, the immediate offſpring of the Arabian. The Spaniſh mules are alſo excellent, and the aſs is here no ignoble animal, though not equal to that of Arabia; whence a far ſuperior breed of this uſeful quadruped might be introduced. The cattle ſeem little remarkable; but the breed of ſheep has been long celebrated as perhaps ſuperior to any in the world, for the delicacy of the mutton, and the beauty of the fleece. The purity of the air, and aromatic paſture, no doubt contribute to both qualities, which, it is to be ſuſpected, would degenerate on tranſportation. Spain produces one or two quadrupeds and ſome birds, not known in the reſt of Europe, as the Viverra genetta, the Vultur percnopterus, the Cuculus glandarius, the Tridactyla, the Motacilla Hiſpanica, and the Hirundines melba, and rupeſtris, all of Linnæus, the latter alſo found in Carniola.* Zoology.

The mineralogy of Spain was anciently of more importance than in modern times. Pliny,[n] after obſerving that ſilver was generally found with galena or lead ore, proceeds to ſtate that the faireſt of all ſilver was found in Spain, where the pits, begun by Hannibal, laſted to his time, being known by the names of their original diſcoverers. That called Bebelo had yielded to Hannibal 300lb. weight a day, a mountain being pierced for a mile and a half, through which the workmen directed large ſtreams of water; ſo that the plan purſued ſeems to have been that called huſhing by modern writers. Strabo informs us that Mineralogy.

* The Spaniſh locuſt has generally roſe-coloured wings, and ſeems indigenous. Dillon, 268.

[n] Lib. xxxiii. cap. vi. [o] Lib. iii.

the

MINERALOGY.

the province of the Turditani, modern Andalusia, was the most productive of precious metals; and gold, silver, brass, and iron were no where found more abundant, nor of better quality: gold was found in the sands of the rivers and torrents, a known attribute of the Tagus. His account also leads us to infer that hushing was the method practised. That geographer adds, that though the Gauls affected to prefer their precious metals, which were found in Mount Cemmenus, chiefly towards the Pyrenees, or that part of the Cevennes which lies near Foix, yet the Spanish were doubtless superior, lumps of pure gold being sometimes found half a pound in weight; but it was frequently discovered in the state of electrum, or mingled with silver. Strabo also mentions gold and silver mines among the Artabri in the N. of Portugal; and Polybius informs us concerning the mines of silver near Carthagena, which occupied a number of workmen, and yielded to the Romans 25,000 drachms daily. Other mines of silver were found near the sources of the Bætis. This intelligence becomes of the more importance, as Britain and other regions of the west certainly derived their gold and silver from Gaul and Spain, in return for cattle, hides, and other products.

At present almost the only silver mines in Spain are those of Guadalcanal, in the Sierra Morena, but rich veins of that metal, in a fuliginous state, exist in many places.[13] At Almaden in La Mancha are valuable mines of quicksilver, which are chiefly remitted to Spanish America, and employed in refining the more precious metals. Calamine appears near Alcavas; cobalt in the Pyrenees; antimony in La Mancha; copper on the frontiers of Portugal;* tin in Galicia; and lead is common as in many districts. The iron of Spain is abundant, and still maintains its high character; and coals are found in the district of Villafranca, in Catalonia, where also occur gold, silver, copper, and lead.[14] Amber and jet (in Spanish *azabache*) are found together in

[13] Journal des Mines, An. v. 387, &c.

* See Dillon, 196. for an account of the copper mine of La Platilla, near Molina. At Rio-tinto there is a rich mine of copper. MS. notes.

The richest lead mine is at Linarez in Jaen. Bourg. ii. 97.

[14] Townf. iii. 344, 345.

the

the territory of Beloncia in the Asturias. The amber is bedded in slate, and presents a woody appearance, but when broken there are white nodules, enclosing the substance which is of a bright yellow. The other minerals are rather curious than important, such as the beautiful crystallized sulphur found at Conilla not far from Cadiz, the elastic marble of Malaga, the green marble resembling the Verde Antico found near Granada, and the red gypsum with red crystals of Compostella. Murcia produces that fine red earth called *almagra*, with which the Spanish snuff is mingled.[15] The aventurine seems a Spanish name, and a Spanish discovery, being a felspar sprinkled with golden mica, discovered in Arragon and near the mountain of Gata, as already mentioned, but fine specimens are also brought from Piedmont; and according to some late mineralogists, the richest are the Russian, from the little isle Cedlovatoi in the White Sea. MINERALOGY.

Spain contains many mineral waters, but few are celebrated. The hot springs of Rivera de Abajo are situated not far from Oviedo, and bear some resemblance to those of Bath. Near Alicant are the baths of Buzot, warm springs of a chalybeate nature, rising like the former among calcareous hills. Mineral Waters.

The natural curiosities of Spain have been little illustrated. The rock of Gibraltar, as is well-known, in some parts contains bones which have been supposed to be human; but are now discovered to belong to quadrupeds, and to have been deposited in the fissures from above. This rock is chiefly calcareous, and on the west side is a stalactitic cave called St. Michael's. The river Guadiana, rising in a calcareous country, appears and disappears like some of our streams in the N. of England under similar circumstances. A deep and rugged dale near Alberca, in Estramadura, once attracted great notice from the singular manners of the inhabitants.[16] Natural Curiosities.

[15] J. des M. Ib. [16] Dillon, 270.

SPANISH ISLES.

The chief circumjacent islands belonging to Spain are Majorca, Minorca, and Eviza; or according to Spanish orthography Mallorca, Menorca, Ibiza. Majorca is about 55 English miles in length, by 45 in breadth. The N. W. part is hilly; the rest abounds with cultivated land, vineyards, orchards, and meadows; the air is temperate, and the honey highly esteemed: there is generally a considerable military force in the isle. The capital, seated on a fair bay, is an elegant city, and is supposed to contain 10,000 inhabitants. Here was born the famous Raymond Lully, a visionary of the fourteenth century. Majorca was re-conquered from the Moors by James I, king of Arragon, in 1229. In 1262 it was assigned to a prince of the house of Arragon: James the first king died in 1311, aged 68; and was succeeded by Sancho; who in 1324 was followed by James II, defeated and slain in 1349 by the army of the king of Arragon, to which crown the isle reverted. James II king of Majorca drew up a code of Palatine laws, for the domestic government of the palace, which is still extant.

Majorca.

Majorca is generally in too strong a state of defence to admit of an easy conquest, but Minorca has been repeatedly seized by the English, to whom it presents an advantageous station for the Mediterranean trade. It is about 30 miles in length, by about 12 of medial breadth. The air is moist, and the soil rather barren, being chiefly calcareous, with lead, and fine marble. The wine is praised; and the inhabitants retain a share of their ancient reputation as excellent slingers. Cittadella, the capital, has a tolerable haven, but the population and fortifications are of little consequence. Port Mahon on the S. E. has an excellent harbour; and received its name from Mago the Carthaginian general.

Minorca.

Eviza is the nearest to Spain, about 15 miles long and 12 broad. It is remarkable for its fruits, and abundance of excellent salt.*

* The *red* chiefly is exported. MS. notes.

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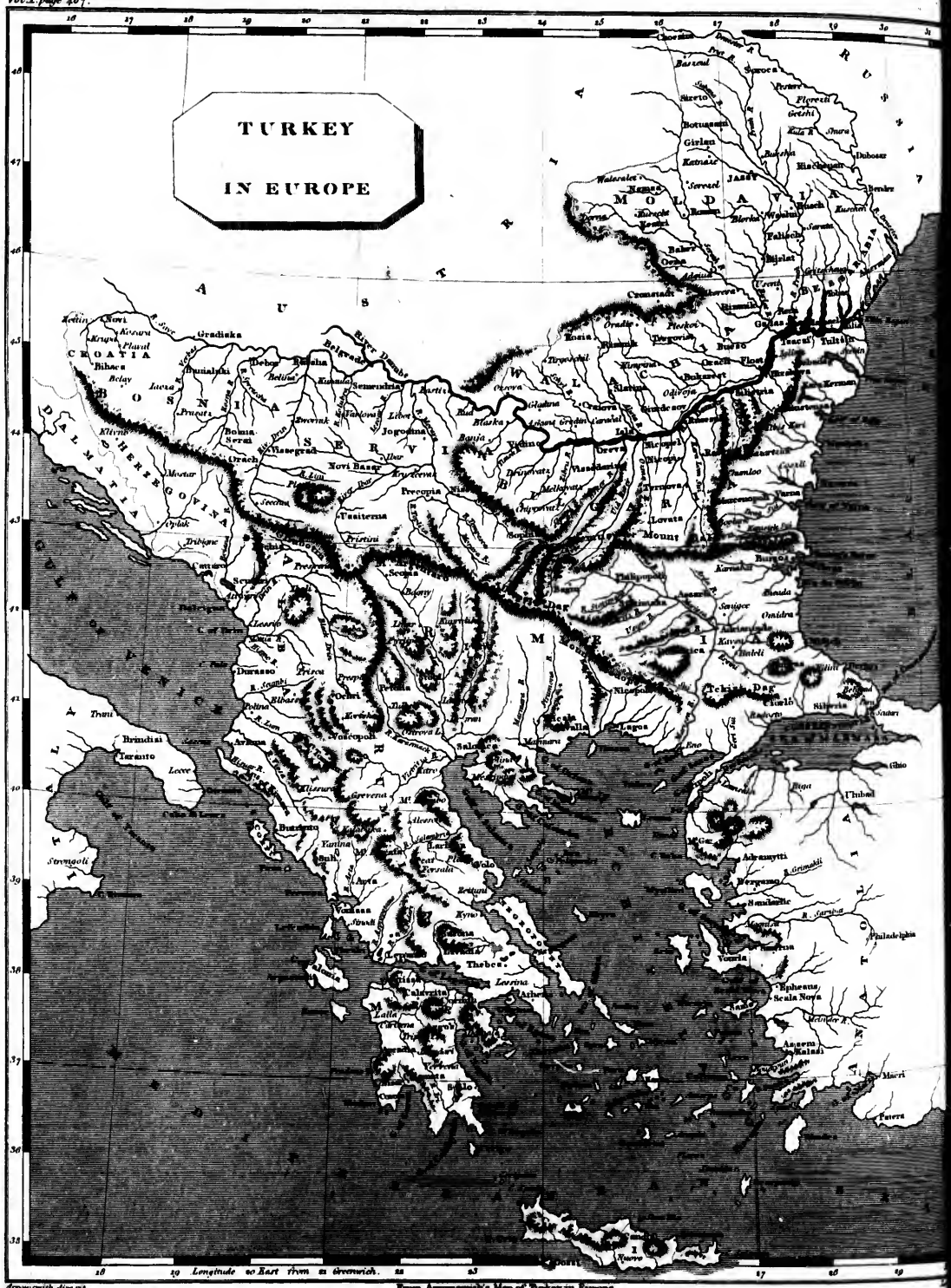

Arrowsmith direxit.

From Arrowsmith's Map of Turkey in Europe.

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TURKEY IN EUROPE.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

THE Turkish empire, once so formidable to Europe, has lately sunk before the power of Russia; and may probably, at no very distant period, be utterly annihilated, or reduced to a few Asiatic provinces. Yet ancient fame conspires with the remaining extent and population of the Turkish dominions, to entitle this power to a place among the preponderating sovereignties both of Europe and Asia. Turkey in Europe is computed to contain 182,560 square miles; an extent which exceeds that of Spain, or even France under the ancient monarchy; and must therefore be still classed among the leading powers even of this quarter of the world.

NAMES AND PROVINCES.

As European Turkey forms a recent sovereignty, the greater part of which was subjugated in the fifteenth century, after the fall of Constantinople and of the Byzantine empire, there is no ancient appellation for its whole extent. It embraces many ancient kingdoms and republics, which now only afford a melancholy remembrance of classical names and events. Moldavia, the most northern province, was part of ancient Dacia, and Jassy, or rather Yassy, according to the indigenal pronunciation, the capital, was the *Iassiorum Municipium* of the Romans.

NAMES, &c. Budzac, or Beſſarbia, was a country of the Getæ and Peucini. Walachia was alſo a province of the ancient Dacians; while Bulgaria on the S. of the Danube embraces nearly the two provinces of Mæſia. Romelia, a vaſt territory, contains ancient Thracia, Pæonia, Macedonia, and the northern part of the claſſical country of Greece; while the Morea is equivalent with the ancient Peloponneſus. To the W. of Romelia entends Albania; which includes the kingdom of Epirus, Chaonia, and a part of Illyricum. Dalmatia retains its ancient appellation: while Servia and Boſnia repreſent ancient Pannonia. Turkiſh Croatia, the moſt weſtern province of the empire, alſo forms a portion of ancient Pannonia, with perhaps a ſmall diſtrict of Noricum; but the Turkiſh part of Croatia is a diminutive province, about 40 miles in length by 20 in breadth, limited by the river Save on the north, and partly by the river Unna on the weſt.

In recent times Turkey has loſt the provinces of the Krim, and new Servia, which, with ſeveral Aſiatic diſtricts, have become ſubject to Ruſſia; and on the W. Tranſylvania, Sclavonia, with the Buckovin a part of Moldavia, and a great part of Croatia, have fallen under the power of Auſtria.

Extent. Turkey in Europe extends about 870 miles in length, from the northern boundary of Moldavia, to Cape Matapan in the Morea. The breadth, from the river Unna to Conſtantinople, is about 680 Britiſh miles. The eaſtern and ſouthern boundaries are formed by the Euxine or Black ſea, the ſea of Marmora, the Archipelago, and the Mediterranean. The utmoſt northern limit is now the river Dnieſter; but the weſtern often conſiſts of an arbitrary line, and is ſometimes ſupplied by rivers or mountains.

Original Population. The original population of this empire chiefly ſprung from the ancient Scythians on the Euxine, the progenitors of the Dacians, Thracians, &c. and even of the Greeks. Theſe were originally blended towards the north, with many Sarmatic or Slavonic tribes: and on the fall of the Roman empire the latter ſpread more and more towards the ſouth, ſo that nearly one half of the population may now be regarded as Slavonic; but Walachia is ſuppoſed to contain many deſcendants of the ancient Roman ſettlers in Dacia. The extent of the Turkiſh

Turkiſh empire has contributed to mingle this original population with various Aſiatic races, among whom the Turks themſelves deſerve particular mention. That branch called the Ottomans, which has proved ſo deſtructive to Europe, derived their name from the Calif Othman, who reigned in the beginning of the fourteenth century, and extended his ſway into the plains of Bithynia, in which he conquered Nicomedia and Pruſa, and thus approached even to the gates of Conſtantinople.[1] But the name and power of the Turks are of far more remote antiquity. They are ſuppoſed to have deſcended from the Altaian mountains in Tatary, about the middle of the ſixth century; and ſpread gradually towards the weſt, till they reached the lake Mæotis.[2] Yet the ſtrength of the empire reſtricted them to the region near the river Oxus, whence the Califs derived their Turkiſh guards, who afterwards ſubverted the throne of Bagdad. The Hungarians, who ſpead deſtruction through great part of Europe in the tenth century, are known to have been a branch from the Finniſh ſtem. The Turks, or Turkomans, properly ſo called, ſpread from the Oxus and Samarcand to the eaſt of Perſia, where Mahmoud of Gazna eſtabliſhed a powerful kingdom, ſubdued by the Turks of Bochara, who in the eleventh century founded the dynaſty of the Seljuks. The ſultans of this race gradually extended their power towards the weſt, and Armenia and Georgia were among their firſt acquiſitions in the Byzantine empire; the continuation of which ſeems remarkable, when it is recollected that the Turks had almoſt ſubdued the whole of Aſia minor, before the commencement of the twelfth century. Yet the progreſs of the Cruſades checked the extenſion of the Turkiſh ſway, and by the capture of Nice conſtrained them to remove the ſeat of power to Iconium. Towards the middle of the fourteenth century the Turks firſt paſſed into Europe; and ſoon after ſeized the greateſt part of Thrace. In the beginning of the fifteenth century their ſultan Bajazet extended his conqueſts even to the Danube; and the provinces of Thrace and Macedonia, fell under the Turkiſh ſceptre, while Adrianople became the ſeat of their government.

ORIGINAL POPULATION.

[1] Gibbon, xi. 432. [2] Ib. vi. 284.

From

Original Population.

From this deduction it will appear that it was chiefly with European troops that the Turks finally subverted the Byzantine empire. From the diversity of nations which joined their standard, from intermarriages with women of Circassia, and many other circumstances which need not be here recapitulated, the modern Turks may be regarded as a mixture of many races of men. If they originally sprung from the Altaian mountains, as the best records induce us to believe, they seem to have formed a part of the nations styled by the ancients "the Scythians beyond the Imaus;" and their subsequent settlement on the Oxus must have swelled their population with Sogdian and Bactrian tribes.

Progressive Geography.

The progressive geography of Turkey in Europe is reflected in the greatest lustre from the classical pages of antiquity, and through the annals of the Byzantine empire to modern times. It would be idle to repeat the well-known geography of ancient Greece, and of the regions to the north of that illustrious seat of arts and letters. Under the Byzantine empire, in the tenth century, they equalled any European provinces, or *themes* as they were quaintly denominated; and while that of the Peloponnesus contained no less than forty cities, we lament the devastations of the Ottoman barbarians, whose only power is to destroy, and whose baleful sway extinguishes all industry and prosperity. The Turkish division into provinces has been already stated: and it may perhaps be speedily the office of geography to repeat the new provinces established by the Russians and Austrians.

Historical Epochs.

It would be equally difficult and unsatisfactory minutely to state the historical epochs of this extensive dominion, containing so many ancient kingdoms and states. It shall therefore be only premised that, after the Roman arms had subdued these countries and cities, many of which are celebrated in the most ancient pages of history, they became in the fifth century an important part of the Byzantine empire; and the historical epochs most appropriated to the present design will delineate their gradual subjugation by the Turks.

1. The first dawn of Turkish history preceeding the reign of Othman, A. D. 1299.

2. In the reign of his successor, Orkan, the Turks take Gallipoli, and penetrate into Thrace; which province was soon after conquered,

and Adrianople was taken A. D. 1360. Two years afterwards the sultan Amurath eſtabliſhed the famous military bands called janizaries, compoſed of Chriſtian ſlaves educated in Mahometaniſm from their infancy. HISTORICAL EPOCHS.

3. The reign of Bajazet, who defeats the Hungarians at Nicopoli, in Bulgaria, A. D. 1396. In 1402 the famous battle near Ancyra, between Bajazet and Timur, which for a period checked the Turkiſh power: yet in 1412 the Emperor Sigiſmund was defeated by the ſultan Mouſa with great ſlaughter.

4. The Turks continue to encreaſe their dominion in Europe, though they received ſevere checks from the Hungarians under Hunniades, and even from the Albanians commanded by the celebrated George Caſtriota, called by the Turks Scanderberg.

5. Conſtantinople taken by the Turks on the 29th of May 1453. In 1456 the ſiege of Belgrade by Mahomet II. Corinth and the Morea became ſubject to the Creſcent A. D. 1458. In 1480 Otranto in Italy was taken by the Turks, an event which diffuſed great terror throughout Europe.

6. A conſiderable acceſſion to the Turkiſh power by the conqueſt of Egypt, A. D. 1517. In 1522 Rhodes ſubmits to the Turks: the knights were afterwards transferred to Malta. In 1526 the noted battle of Mohatz, in which Lewis king of Hungary periſhed; and the ſultan Soliman ſoon after took Buda. In 1529 he beſieges Vienna at the head of 250,000 men, but the city being bravely defended by Frederic, prince palatine, the Turks withdrew with great loſs. In 1552 the Turks ſeized the Bannat of Temeſwar: and took Cyprus from the Venetians in 1571.

7. In the ſame year was the famous naval battle of Lepanto, which delivered Europe from any apprehenſion of the Turks by ſea. They continued however to invade Hungary with various ſucceſs. But their wars with Perſia gradually diverted their arms from Europe. In 1642 the ſultan Ibrahim took from the Coſſacs the town of Azof at the mouth of the Don. Towards the middle of this century, they ſeized ſome Grecian iſles, which the naval power of the Venetians had enabled them to retain.

8. Mahomet

Historical Epochs.

8. Mahomet IV renews the wars against the emperor of Germany; and in 1663 the Auſtrians were defeated in Hungary. The iſle of Candia is taken in 1669 after a long blockade and ſiege. Wars with Poland. The ſiege of Vienna, 1683, raiſed by John Sobieſki king of Poland. Hungary became the ſcene of repeated Turkiſh and Auſtrian conqueſts, till 1699, the peace of Carlovitz, by which the Turks yielded Tranſylvania to the Auſtrians, the Morea to the Venetians, and Azof to the Ruſſians.

9. In 1736 a ſucceſsful war with the Ruſſians and Auſtrians; the Turks by the peace of 1739 reſumed Belgrade and Orſova, with ſome parts of Servia and Walachia, formerly ceded to Auſtria; and Ruſſia is conſtrained to abandon Azof.

10. The more recent wars of the Ruſſians againſt the Turks, and the ſubſequent decline of the Ottoman empire.

Some of the events here commemorated are comparatively minute; but the Turkiſh power has been ſo deſtructive, wherever it ſpread, to the beſt intereſts of humanity, that even the ſmaller ramifications of ſuch a peſtilence ſeem not undeſerving of being commemorated, with the ſame curioſity that natural hiſtorians deſcribe the utmoſt extent of an earthquake.

Antiquities.

The ancient monuments of European Turkey are well known to exceed in number and importance thoſe of any other country. The remains of ancient Athens, in particular, formerly the choſen ſeat of the arts, have attracted the attention of many travellers, and have been ſo repeatedly deſcribed that any further comment would be ſuperfluous. A venerable monument of antiquity, the church dedicated to the divine wiſdom, or vulgarly Sancta Sophia, by the emperor Juſtinian in the ſixth century, has been fortunately preſerved, by being converted into a moſk, though the architecture be greatly inferior to that of the claſſical period, yet the effect is grand and impreſſive, and the cupola is admired as a bold and ſkilful effort of the art, while the ſeeming weight is diminiſhed by the lightneſs of the materials, being bricks formed of a particular clay which will float in the water.[3] The interior is adorned with a profuſion of marble

[3] Gibbon, vii. 120. This clay is chiefly magneſia.

 columns,

columns of various beautiful deſcriptions, the purple Phrygian, the Spartan green, the red and white Carian, the African of a ſaffron colour, and many other kinds. The other antiquities of Conſtantinople, and other parts of European Turkey, would occupy many pages in the bare enumeration, which would be little gratifying to the reader whoſe curioſity will be better ſatisfied by the prints, than by any deſcription of ſuch objects, which can never convey diſtinct ideas. Suffice it here to obſerve that the French have recently diſcovered the remains of the ancient ſea-port belonging to Sparta, near a barren promontory, which projects from the ſouth of the Morea; and that the antiquities and geography of that part now ſtyled Albania, ſtill preſent a field of reſearch to the enterprizing traveller. ANTIQUITIES.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

RELIGION. THE religion of the Turks is the Mahometan: but of their subjects, in this division of the empire, it is probable that two thirds are Greek Christians; a circumstance which would facilitate and endear the domination of the Russians, who follow the same persuasion. The religion of Mahomet has been recently cleared from many erroneous representations; but its pernicious effects are sufficiently visible in the destruction of art and industry, wherever it has made its appearance. The exclusive attachment to the Koran, the rigid fanaticism, and the contempt for profane knowledge, conspire with the devout hatred against all unbelievers, to prevent any intercourse with other sects, and thus to erect a barrier against every branch of science and industry. While the Mahometans regard all other nations as dogs, to use their own expression, it is no wonder that they themselves should sink into an ignorance and apathy truly brutal. This single principle of usurped superiority must ever render them inferior to other nations; but as the Turkish Sultan has been for some centuries the chief leader and support of this devouring system, of which his subjects themselves begin to perceive the defects, it is to be conceived that his fall would considerably weaken the Mahometan faith; and that those proud usurpers of all human virtue and merit would find their former arrogance returned with due contempt by surrounding nations. The Mufti or Mahometan pontiff presides at Constantinople; but his power has seldom interfered with the civil government. Next to him in rank are the Moulahs, who, though esteemed dignitaries of the church, are in fact

fact rather doctors of the law, while the Koran is alſo a code of civil obſervance, and is expounded in numerous treatiſes which regulate the proceedings of the eccleſiaſtic judges.[1] From the Moulahs are ſelected the inferior Muftis, or judges, throughout the empire; and the Cadileſquiers or chief juſtices. Religion.

The next claſs of divines are the Imaums or pariſh prieſts, who perform the ſervice of the moſks, while the Cadis are judges annually appointed to adminiſter juſtice in the towns and villages, being themſelves to be regarded as churchmen, who like the Moulahs have directed their chief attention to the juridical part of the Koran.

From this brief view it will be obſerved, that the eccleſiaſtical orders of Muftis and Imaums ſomewhat reſemble the Chriſtian biſhops and parochial clergy: while the other diſtinctions ariſe from the ſingularity of both religion and laws being united in the Koran, ſo that a lawyer or judge muſt at the ſame time be a ſkilful divine.

The Turks have alſo their monks, ſtyled Derviſhes, of four various orders and inſtitutions, dedicated by ſolemn vows to religious offices, public prayer, and preaching. A moſt ſingular order is that of the Kadri, who appear almoſt in a ſtate of nudity, and affect to diſplay their devotion by frantic and extravagant dances.

The Greeks, along with their faith, retain their prieſts, biſhops, archbiſhops, and patriarchs; but their church is in the laſt ſtate of degradation, and its dignities openly ſold by the Turks. Travellers have expreſſed the deepeſt regret at this abomination, ariſing partly from the Mahometan delight in rendering the Chriſtians contemptible; and partly, it muſt be confeſſed, from the miſerable ambition and avarice of the Greek eccleſiaſtics, who think they can atone by idle ceremonies for the neglect of all the invaluable morality of the goſpel.

The eccleſiaſtic geography of theſe degraded regions muſt of courſe be only intereſting to the mere antiquary, as it can throw no light on its hiſtory, and little even on its topography. Eccleſiaſtic Geography.

The Sultan is a deſpotic ſovereign; but he is himſelf ſtrictly ſubject to the laws of the Koran, which including alſo the national religion, raiſe ſuch obſtructions to his abſolute will, that an intelligent traveller Government.

[1] Porter's Obſervations on the Turks, p. 41, &c.

GOVERNMENT.

pronounces many Chriſtian ſovereignties more deſpotic.[2] Yet the ſame author allows that, in order to ſecure private property, the reverſion is commonly aſſigned to the church, which would thus in time ſwallow up all the eſtates and poſſeſſions of the empire. In no European country has the government ever been ſo deſpotic that a recourſe to ſimilar practice became neceſſary. But it appears that the deſpotiſm of the monarch is balanced by a religious ariſtocracy; and not to mention the inſurrections of Janizaries or Prætorian bands, the common peril of every deſpotic adminiſtration, the recent diſaſters have greatly infringed the power of the Sultan: for many Paſhas have uſurped the ſovereign power over their own provinces, and ſet every effort of the Porte at defiance, than which there cannot be a ſtronger ſymptom of the perdition of the empire.

LAWS.

The Turkiſh laws, as has been already mentioned, are contained in the Koran, and in the comments of approved and renowned doctors. As unhappily no religious ſyſtem has ever made its firſt appearance amid a great and enlightened nation, but only in ſmall tribes, and in the firſt ſteps of the ſocial progreſs, ſo the laws of the Koran, however well adapted to a few poor and ſimple Arabs, yet as Mahomet had no viſion of the glories of Bagdad, Iſpahan, Samarcand, Delhi, Cairo, Cordova, or Conſtantinople, his code little provides for the advanced ſtages of ſociety. To ſupply this defect, ſucceſſive Moulahs of high reputation, uſing the Koran as a kind of text, have conſtructed commentaries which have acquired the force of laws. The Turkiſh empire is chiefly guided by thoſe of Abou-Haniſe. As a due ſkill in theſe commentaries requires conſiderable ſtudy, eccleſiaſtics verſed in this ſcience became in ſome degree a diſtinct body from thoſe merely dedicated to the prieſthood. The laws concerning property are ſufficiently equitable; and it is a groſs miſtake to ſuppoſe that females do not inherit; but it would be vain to deny that the avarice of the Paſhas, and the venal diſpoſition of the prieſts, would overleap the barriers ſet even by Mahomet, and much more thoſe appointed by his commentators. The written laws of a country may be excellent, while the mal-adminiſtration leads to every oppreſſion; and the moſt enlightened travellers leave no doubt that any

[2] Porter, p. 76.

decision

decision may be purchased from a Turkish judge. Where both parties have nothing to give, and the judge is free from caprice, perhaps a shadow of justice may be expected. **Laws.**

Turkey in Europe has been computed to contain 8,000,000 of inhabitants; and the extent being supposed 182,560 square miles, the allotment will be 43 to the mile square. It is probable that this number rather exceeds the truth, when it is considered that these regions are intersected by many mountainous and barren tracts; and that the population even of the best provinces impresses all travellers with a striking defect. **Population.**

A Turkish colony would be a contradiction in terms, as far from any thought of improving distant regions, they are busy in destroying their own. **Colonies.**

The Turkish army and navy may deserve more particular consideration under the head of Asiatic Turkey, as the chief sources fall under that division. It may here be briefly remarked that there are about 30 ships of the line; while the army, after the defection of many Pashas, can scarcely exceed 150,000, ill disciplined, and dispirited by successive disasters; and more destructive to their own provinces, through which they must pass, than to any state with which they are at enmity; more terrible to their friends than to their foes. **Army.**

The revenues of the whole Turkish empire are computed at about 7,000,000 sterling, while the usual expence does not exceed five. This revenue is partly derived from the capitation tax on unbelievers, and from the *zecchat* or customs; but principally from the tax on land amounting to about six shillings an acre, and which is called the *jizie*. The sultan is also supposed to possess a considerable private treasure; which, when called forth by the exigencies of the state, will probably be found of as small account as the treasures of similar fame which fell into the hands of the French. A more real treasure may be expected from the arbitrary exactions from the rich, particularly the Christians. **Revenues.**

The palpable and rapid decline of the Turkish empire has of course greatly impaired its political importance. At the beginning of the sixteenth century, when European politics began to assume some consistency, France, being alarmed by the growing power of the house of Austria, **Political Importance and Relations.**

POLITICAL IMPORTANCE, &c.

Auſtria, entered into an alliance with Turkey, the repeated ſubject of murmur among the Chriſtian powers. Nor was this alliance of much advantage to France, except in ſecuring a more favourable mercantile reception in the Levant; for the diverſions thereby afforded to the Auſtrian arms were ſeldom well timed, or of much importance. This long alliance has been recently violated by the imprudence of the French rulers, who choſe to attack Egypt by open force, without the conſent of the Porte, which deriving little or no advantage from that nominal ſovereignty, would gladly have given it to France as a reward for any active ſervices. In conſequence of this violation the Porte joined the Auſtrians and Ruſſians, in the war againſt France; but the Creſcent did not appear on the French frontiers. In virtue of this alliance Ruſſian ſquadrons of war have paſſed the ſacred walls of the Seraglio; and inſpected as friends that weakneſs which may aſſiſt them as enemies. Politicians conſidered this alliance as a mere temporary friendſhip, produced by violent circumſtances; and it is probable that not many years will elapſe before Ruſſia and Auſtria again conſpire againſt European Turkey. The Turks are ſenſible that a ſtrict alliance with Pruſſia would be of ſingular advantage to them; that power can have little intereſt in ſuch a treaty, but muſt on the contrary rather exult to ſee the power of Ruſſia exerted againſt Turkey and Aſia. Meanwhile the Turks have ſpared no endeavour to ſecure the friendſhip of ſeveral European powers, and have appointed reſident ambaſſadors at ſeveral courts, who may be regarded as heralds of their fall; for in their proſperity they diſdained to ſend any envoys, and regarded the ambaſſadors at the Porte as tributary ſlaves, ſent to ſolicit the protection of the Sultan. Amidſt the defection of ſeveral Paſhas, in the eaſt as well as in Europe, it is fortunate for the Ottoman empire that the power of Perſia is dormant.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs. — Language. — Literature. — Education.—Universities.— Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE manners and customs of the Turks are distinguished by the peculiarity of their religion from those of other European nations. On the birth of a child the father himself gives the name, putting at the same time a grain of salt into its mouth.[1] The circumcision is not performed till the age of twelve or fourteen. Marriage is only a civil contract, which either party may break, and is managed by female mediation, the youth seldom seeing his bride till after the ceremony. The dead are perfumed with incense, and buried in a cloth, open at the top and bottom, that the deceased may be able to sit up and answer the questions of the angels of death. The burial-grounds are near the highways; and stones are often placed at the head of the graves, with carved turbans denoting the sex. As they never intrench upon a former grave, the cemeteries are very extensive. In diet the Turks are extremely moderate, and their meals are dispatched with great haste. Rice is the favourite food, and is chiefly dressed in three ways; the pilau, boiled with mutton or fowl; the lappa, or mere boiled rice; and the tchorba, a kind of broth of the same vegetable. In boiling the meat is cut in small pieces; and in roasting still smaller, a bit of meat and an onion being placed alternately on a very long spit. The fish of the Archipelago are excellent; and the beef tolerable, except that of the buffalo which is very hard. The hares, partridges, and other game are of superior flavour. The meal is usually spread on a low wooden table, and the master of the house pronounces a short prayer. The

[1] Tournefort, i. 47.

 frugal

MANNERS AND CUSTOMS.

frugal repaſt is followed by fruits and cold water, which are ſucceeded by hot coffee and pipes with tobacco. The houſes of the Turks are ſeldom expenſive; and the chief furniture is the carpet which covers the floor, with a low ſofa on one ſide of the room. In regard to dreſs, Tournefort[2] obſerves that the uſe of the turban is unhealthy, becauſe the ears are expoſed, and its thickneſs prevents perſpiration. The ſhirt is of callico; and the looſe robe is faſtened by a girdle, in which is ſtuck a dagger; while the tobacco box, pocket-book, &c. are worn in the boſom. The robe is generally of European broad cloth, trimmed with various furs. The ſhoes, or rather ſlippers, are ſlight, and unfit for much exerciſe. The dreſs of the women differs little from that of the men, the chief diſtinction being the head-dreſs; that of the fair ſex conſiſting of a bonnet, like an inverted baſket, formed of paſteboard covered with cloth of gold, or other elegant materials, with a veil extending to the eyebrows, while a fine handkerchief conceals the under part of the face. The perſonal cleanlineſs of both ſexes is highly laudable; but the European eye is not pleaſed with the female cuſtom of ſtaining the nails with a red tincture. The amuſements of the Turks partake of their indolent apathy, if we except hunting, and thoſe of a military deſcription. To recline on an elegant carpet, or in a hot ſeaſon by the ſide of a ſtream, and ſmoke the delicate tobacco of Syria, may be regarded as their chief amuſement. With opium they procure what they call a kief, or placid intoxication, during which the fancy forms a thouſand agreeable images, but when the doſe is too potent theſe are ſucceeded by irritation and ferocity. Cheſs and draughts are favourite games; but thoſe of chance are conſidered as incompatible with ſtrict morals. The coffee-houſes, and the baths, furniſh other ſources of amuſement; and the bairam, or feſtival which follows their long lent, is a ſeaſon of univerſal diſſipation.

Language.

The Turkiſh language is of far inferior reputation to the Perſian or Arabic, being a mixture of ſeveral dialects, and poſſeſſing neither the force, elegance, nor purity of thoſe two celebrated oriental tongues. Literature is not however totally neglected, and it has been repeatedly attempted to eſtabliſh a printing preſs at Conſtantinople; but the de-

[2] i. 79.

ſign

ſign failed from the intereſt of the copyiſts, who inferred that this art would deprive them of their bread. A late traveller[3] informs us that there are in this capital ſeveral *kuttub-chans*, or public libraries, among which are thoſe of Saint Sophia and the Solimanie Jamaſy; but none ſo elegant as that founded by the grand vizir Raghid, which is wholly built of marble in the midſt of a ſquare court, and is filled with books chiefly theological. A librarian conſtantly attends, and there are convenient ſeats with carpets and cuſhions. In the neighbourhood is a ſchool founded by the ſame vizir, in which about 100 boys are taught to read and write. The market for books is extenſive, containing many ſhops well ſupplied with oriental manuſcripts. The Turks have their ancient poets, hiſtorians, and divines; but of little reputation when compared with thoſe of Perſia or Arabia. LITERATURE.

The ſtate of education among the Turks may be conceived to be very low, and ignorance is indeed a chief part of the national character. The only profeſſion which requires a ſhadow of learning is that of the law, which, as before explained, is intimately connected with their theology. The celebrated doctors have diſciples, who are trained up to that department; but there ſeems nothing that can deſerve the name of college or univerſity. Education.

The chief city of European Turkey, and of the Turkiſh empire, is Conſtantinople, ſo called becauſe founded by Conſtantine, on the ſite of the ancient Byzantium. The advantages of the ſituation can hardly be exceeded, and the aſpect from the ſea is peculiarly grand; but on a nearer approach the wooden hovels, and narrow ſtreets, diſappoint the ſplendid expectations of the ſpectator. The beautiful deſcription by Gibbon is known to every reader; and recent travellers have applauded its accuracy.[4] This capital forms an unequal triangle, reſembling a harp, being about twelve or fourteen Engliſh miles in circumference, encloſed by walls, and on two ſides by the ſea, and the harbour called the Golden Horn. The inhabitants are computed at 400,000, including the four ſuburbs, Galata, Pera, Tophana, and Scutari. Of theſe 200,000 are Turks: 100,000 Greeks; and the remainder Jews, Armenians, and Franks. The moſt celebrated edifices are the Seraglio, Cities and Towns. Conſtantinople.

[3] Browne, p. 422. [4] Dallaway's Conſt. 15.

Cities and Towns.

which comprizes a large ſpace crowded with various buildings of mean architecture; and the moſk of Sancta Sophia, already mentioned. The principal entrance of the Seraglio is ſtyled Capi, or the Porte, an appellation which has paſſed to the Turkiſh court. The frequent viſitations of the peſtilence, and the conflagrations often kindled by popular diſcontent, render Conſtantinople an unpleaſant reſidence.

Adrianople.

Next in dignity and extent is the city of Adrianople, formerly the European ſeat of the Turkiſh dominion. This city, which ſtands about 140 Britiſh miles to the N. W. of Conſtantinople, was founded by the emperor Hadrian on the ſite of the ancient Oreſtias. It is waſhed by the Hebrus, now the Maritz, which here receives two tributary ſtreams.[1] This ſecond city of European Turkey is of a circular form, ſurrounded by a wall and towers. Many of the houſes are reſpectable, but the ſtreets are narrow and indirect. The ſeraglio is in a pleaſant ſituation, ſeparated from the city by the river Arda, and commanding an extenſive view of the country, which is fertile, and remarkable for excellent vines. Several of the moſks are of celebrated ſplendour, and the commerce of the city by the river is not inconſiderable.*

Filibe, or Filipopoli, is meanly built, without fortifications, or one good ſtreet; the ſituation being ſo low and moiſt, that the mud is ſometimes two feet deep, and ſtones like poſts are ſet up to facilitate the progreſs of foot paſſengers. Yet it is a city of conſiderable ſize.[6]

Sofia.

The city of Sofia, ſituated in a low country N. W. from Adrianople, is of conſiderable trade, but meanly built: the inhabitants are computed at 70,000.

Siliſtria in Bulgaria, on the river Danube, is computed to contain 60,000 ſouls; while Bucchoreſt, the chief city of Walachia, is eſtimated at the ſame number; but Jaſſy, or Yaſſy, the leading town of Moldavia, and Bender of Beſſarabia, are only eſtimated each at 10 or 12,000.

Belgrade.

Belgrade, the capital of Servia, repeatedly diſputed between the Auſtrians and Turks, is now deſtitute of fortifications, but is ſuppoſed to

[1] Buſching, iii. 340.

* Add, from the information of a late traveller in MS., that this city is nearly two miles in circuit, unfortified: on the S. E. is a large moſk on a hill, whence the city ſlopes to the N. W.

[6] MS. information.

retain

retain about 25,000 inhabitants. Banjaluka in Bosnia is also a considerable town, supposed to contain 18,000 souls. Cities and Towns.

In the more southern provinces must first be named Salonica, computed at 60,000, a city of considerable commerce, seated on a noble gulph of the Archipelago. About 80 British miles to the S. is Larissa, an inland town, but supposed to contain 25,000 souls. Atini, the ancient Athens, is of small population; and this region of classical cities now scarcely presents another town worthy of commemoration in general geography. Salonica.

Exclusive of the seraglios and royal palaces, which themselves possess little claim to architectural grandeur or beauty, the chief edifices in Turkey are the mosks and caravanseras. The most beautiful mosks are those of the capital, and Adrianople, and are generally kept in excellent repair, as the church possesses ample revenues for that purpose, and the interest and honour of the clergy are promoted by preserving their splendour. The caravanseras, on the contrary, are often neglected. These buildings are generally in the form of a square, enclosing a court; the upper chambers being destined for travellers, and the lower for horses and camels. They are often founded by legacies of the opulent; but the trustees, having no personal interest, generally squander or alienate the funds allotted for their support, so that these useful edifices, some of which boast superior elegance, are permitted to fall into shameful decay. Edifices.

The manufactures and commerce of Turkey in Europe are chiefly in the hands of foreigners; but as what is called the Levant trade almost entirely centers in Smyrna, and the Asiatic shore, this subject will be more properly described in that part of this work which relates to Asia. The native manufactures exported from European Turkey are inconsiderable, being chiefly carpets, and a few other articles; but the rude products are far more numerous, as currants, figs, saffron, statuary marble from Paros, silk, and drugs. Manufactures and Commerce.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE extensive regions comprised within the limits of European Turkey enjoy, in general, a delicious climate, pure air, and regular seasons. Ovid, who was banished to modern Bulgaria, has written many elegiac complaints on the severity of the clime; and it seems an undoubted fact that the seasons have become more genial, since Europe has been stripped of those enormous forests, which diffused humidity and cold: for countries, anciently represented as full of morasses and water, are now dry and salubrious; and the rivers are not only confined to narrower channels, but many that used to freeze every winter now devolve a turbid but free stream. The climate of Moldavia, which Ovid would have painted like that of Lapland, is now little inferior to that of Hungary, though the western part be mountainous, and the eastern present many uncultivated deserts. In Walachia the air is so temperate that vines and melons prosper. In the mountainous parts of the more southern districts the temperature must partake of the cold, universal in such elevated regions; but the products of Macedonia and Greece, rice, vines, olives, shew that the climate retains its ancient praise.

Face of the Country.

The general appearance of Turkey in Europe is rather mountainous; but abundantly interspersed with delicious plains and vales: and to the N. W. of Constantinople there is a plain country of vast extent, while the shores of the Euxine present many level deserts. Besides the grand stream of the Danube many large and beautiful rivers intersect these provinces,

provinces, and the numerous gulphs of the Archipelago and Mediterranean diverſify and enrich the country. Face of the Country.

The ſoil is generally fertile, the northern parts producing wheat and rich paſture, the middle and ſouthern abundance of rice. But agriculture, like every other art and ſcience, is neglected by the Turks; and that ſoil muſt be truly fertile which under their ſway can ſupport its inhabitants. Soil and Agriculture.

Among the rivers of European Turkey muſt firſt be named the Danube, which from Belgrade to Orſova divides Servia from the Bannat, a ſpace of near 100 miles; and afterward becomes a Turkiſh ſtream for more than 400, being in ſome places a mile in breadth, and preſenting, if poſſeſſed by an induſtrious people, all the advantages of a Mediterranean ſea. Rivers. Danube.

Next perhaps in importance, though very inferior, is the Maritz, or ancient Hebrus, which riſing in a chain of mountains anciently called Hæmus, and running towards the E. and S, falls into the Ægean ſea, after a courſe of about 250 miles. The ſame ſea at the gulph of Salonica receives the Vardari, the Ancient Axius, which riſing in mount Scardus, a weſtern branch of the ſame chain, purſues a S. E. courſe of about 200 miles. Maritz.

Two other rivers of ſimilar conſequence flow into the Danube. The Eſker, the ancient Oeſkus, riſes near the ſource of the Maritz, but its courſe little exceeds 120 miles; while the Morava, the ancient Margus, runs about 200. The Drin, another conſiderable river, riſes to the north of Albania, and falls into the Save. Eſker. Morava.

Many other ſtreams of claſſical name pervade theſe regions; but they often derive their ſole importance from their hiſtorical and poetical reputation.

Budzac and Walachia contain ſome lakes of conſiderable extent, as thoſe around Iſmail, and that to the E. of Surza, which communicates with the Danube, or forms a part of that river. Nor are Albania, and the ſouthern provinces, wholly deſtitute of lakes, but rather of claſſical fame than of geographical importance. Lakes.

The chains of mountains are numerous and extenſive. To the W. of Moldavia and the Bukovine runs N. and N. W. for about 200 miles Mountains.

Mountains.

part of the grand Carpathian chain, anciently called the Baſtarnic Alps, from the Baſtarnæ, an extenſive nation, partly of Gothic and partly of Sarmatic origin. The moſt ſouthern branch of this grand chain, tending S. W. for more than 200 miles, forms the N. and W. boundary of Walachia. Ptolemy here delineates mount Peucé, which ſeems the ſame with the Baſtarnic Alps; while the ſouthern branch may be his Sarmatic mountain; nor do the mountains between Walachia and the Bannat ſeem diſtinguiſhed by any modern appellation, except of particular ſummits, as the Grayſor, the Pietrotza, the Semenek.

Hæmus.

On the S. of the Danube appears the grand range of the Hæmus, which Ptolemy repreſents as running from the S. W. to the N. E., while modern obſervations indicate the oppoſite direction; but the recent maps of theſe regions are ſtill very imperfect. D'Anville, in his Ancient Geography, conſiders the Rhodopé as a chain of mountains on the weſtern ſide of ancient Thrace; and the Hæmus as its northern frontier: but this diſtinction is unknown to Ptolemy, who on the contrary places the Rhodopé towards the N. of Thrace, repreſenting it as a branch of the Hæmus. However this be, the chain of the Hæmus is deſervedly celebrated by the ancients, being of great elevation and extent, as appears from the numerous and large rivers which devolve from its ſides. The middle parts of this chain were by the ancients called Scomius and Orbelus; while the Scardus may be conſidered as its furtheſt branch on the weſt. If with D'Anville we place the *Hæmi extrema*, the furtheſt eaſtern point of the Hæmus at Emineh, and thence extend it above Filipopoli and Sofia to the S. of Servia, we ſhall find an extent of more than 400 miles, now known under various names, as Emineh, or Heminch Dag, perhaps a remnant of the ancient appellation, on the eaſt; Bulkan and Samoco in the middle; Ivan W.; while the Deſpoto Dag branches off to the S. E. and may perhaps be the Rhodopé of the ancients. But while the proper delineation and deſcription of mountains, though ſome of the moſt fixed and important features of nature, and diſtinct and appropriated appellations for their chains and branches, remain groſsly defective in other provinces of European geography, it is not a ſubject of ſurprize that great obſcurity ſhould

ſhould be found even in the claſſical regions, which now form a part of the Turkiſh empire.* Mountains.

From the weſtern extremity of the Hæmus ſeem to branch off two other extenſive chains; one running N. W. between Dalmatia on the W. and Boſnia and Servia on the eaſt: while the other paſſing S. forms the mountains of Albania and the W. of Greece. The northern chain begins with the Scardus of the ancients, continued by the Buſſinius and the Albius, an account of which more properly belongs to the Auſtrian dominions. The chain running to the S. has many claſſical appellations, as the Acroceraunian, Pindus, &c. The E. and S. of Greece are alſo crowded with ſmall chains of mountains, and ſolitary hills, ſuch as Olympus, Oſſa, Pelius, and others. Mount Athos a detached ſummit in the N. E. is of conſiderable height, but has chiefly attracted obſervation from its ſingular form, ſo much reſembling that of Montſerrat in Spain; and from the many monaſteries and churches on the declivities of its picturesque pinnacle. Athos.

There are conſiderable foreſts in various parts of European Turkey; but travellers have not diſtinguiſhed them by particular deſcriptions. Foreſts.

While all the Chriſtian countries of Europe have been ſurveyed with more or leſs accuracy either by the independent zeal of their native naturaliſts, or under the honourable patronage of their reſpective governments, the Turkiſh empire, containing the moſt celebrated and beautiful provinces on the face of the earth, has been almoſt wholly excluded from the reſearches of modern botaniſts. That jealouſy of ſtrangers, the reſult of conſcious weakneſs in the government, and of profound ignorance and the meaneſt ſuperſtition in the people, which has uniformly characterized the Ottoman domination, has prevented thoſe viſits to Greece and the provinces ſouth of the Danube which the memory of their ancient glory, and the pure love of ſcience and nature, would have induced. Hence it is that the flora of European Turkey remains in ſo miſerably imperfect a ſtate. The diſtant regions of India, Japan, and Auſtralaſia, the ſultry deſarts beyond the Botany.

* Among the few travellers who have viſited parts of mount Hæmus, is Dr. Brown, See his Travels, London, 1672, 4to. p. 44, &c. He only obſerves that one of the minerals is talc; and that the chain is ſuppoſed to extend from the Euxine to the Adriatic. As no ſummit of the Hæmus ſeems covered with perpetual ſnow, the elevation cannot be conſiderable.

Cape

BOTANY. Cape of Good Hope, the peſtilential ſwamps of America, and the forlorn expanſe of Siberia, have been penetrated by the indefatigable zeal of the Linnæan ſchool; their animals, minerals, and vegetables have been in a conſiderable degree deſcribed and arranged; while the cradle of civilization, the birth-place of thoſe arts and ſciences that have raiſed the nations of Europe to ſo proud an elevation above the reſt of the world, has been trodden for ages paſt by barbarian feet. The vegetable tribes that clothe the rocks of the Cretan Ida, and ſhade the ſummits of Athos and Oeta, that adorn with their varied tints the vale of Tempe and the plains of Theſſaly, that baſk on the ſunny ſhores of the Ægæan, or riſe in ſtately luxuriance on the banks of the majeſtic Danube, ſucceed to each other, generation after generation, unknown and unregarded. A few haſty gleanings, chiefly from the maritime parts, have been brought home by travellers;* but of the botany of the interior, eſpecially of thoſe provinces which lie between the Danube and the Archipelago, we are almoſt wholly ignorant.

The foreſts of Greece, the Greek iſlands, and the provinces bordering the Archipelago to the north, conſiſt of the common and yew-leaved fir, the larch, the cedar, the ilex, the kermes oak, the common oak, the oriental plane-tree, the maple, the ſycamore, the walnut, the cheſtnut, and the beech. The principal fruit-trees are the olive, conſiderable foreſts of which, mixed with the broad-leaved myrtle, adorn the ſhores of Crete and Attica; the orange, the fig, the vine, the piſtachia tree, the maſtich tree, the mulberry, and the pomegranate. Of the ſhrubs and ſmaller trees the moſt worthy of notice are the bay-tree, the laurel, two kinds of *arbutus*, the cypreſs, the *oleander*, and the caper buſh. A large proportion of the ſoil in Greece and the Greek iſlands being calcareous, either of the purer kind of marble and limeſtone, or of the mixed, as effervefcent trap, a large proportion of the Greek flora in its preſent imperfect ſtate conſiſts of thoſe plants that are peculiar to limeſtone diſtricts; the lower acceſſible ridges in Crete are principally marble and other calcareous rocks, hence this iſland has always been celebrated for its vegetable productions; of which the following are the chief, and all of them indicative of a calcareous ſoil: *ſtachys Cretica*, Cretan wound-

* Forſkal, Flora Conſtantinopolitana.

wort;

wort; thiſtle-leaved acanthus; Cretan origany; Cretan dittany; *aſtragalus tragacantha*, tragacanth vetch, from which the gum of this name is procured; *ſalvia pomifera*, apple ſage; *ciſtus ladaniferus*, ladanon ciſtus, an elegant ſhrub, from the leaves and tender ſtalks of which the fragrant gum ladanon exudes; this is collected by whipping the plants with leathern thongs to which the gum adheres, and off which it is ſcraped from time to time. Botany.

The zoology of European Turkey preſents few peculiarities. The jackal, frequent in Africa and Aſia, is not unknown in theſe regions; and among the beaſts of burden muſt be claſſed the camel. The Turkiſh horſes are celebrated for ſpirit and form; and thoſe of Walachia deſerve particular praiſe. Of cattle and ſheep there is little deficiency, but the particular breeds or qualities have been little explained. The ſheep, diſtinguiſhed by the name of Walachian, have ſpiral horns of ſingular elegance; but the fineneſs of the fleece would be a more uſeful diſtinction. Zoology.

The mineralogy of theſe provinces is alſo a barren field, for the indolence and ignorance of the Turks have generally neglected this branch of opulence; though from the mines in the adjacent regions of Hungary and Tranſylvania, and from the ancient accounts, there would be room to expect great mineral treaſures. The gold mines of Philippi, about 80 miles to the eaſt of Salonika, in the time of Philip of Macedon produced yearly about 1000 talents, 2,880,000l. ſterling: and ſilver mines were found in Attica, and other quarters.* Mineralogy.

The mineral waters are little known or celebrated; and the natural curioſities in the northern parts, and around mount Hæmus, remain Mineral Waters.

* From Blaſius Caryophilus (Bigio Garofalo) *de Marmoribus Antiquis*, Trajecti 1743, 4to. it appears, p. 7. that the Tænarian marble of Laconia is the *verde antique*. It is alſo found near Theſſalonica, whence the number of pillars in the church of St. Sophiâ at Conſtantinople; but is totally unknown in Egypt, the ſubſtance found in the valley of Coſſeir being a beautiful green ſiliceous brecia. Ptolemy, iv. 5. mentions the rocks on the weſt of the Red Sea, but it is difficult to explain his *Troicus lapis*.

In the curious collection of the Ancient Mineralogiſts of France, Paris, 1779, tom. i. p. 53, there is a deſcription of the gold mines of Siderocapſa in Macedon, by Belon, 1550. This place is the ancient Chryſites, two days journey from Theſſalonica, not far from the ſea, and near the village of Sicene.

NATURAL CURIOSITIES.

undeſcribed. Among thoſe in the ſouth may be named mount Athos, which, as already mentioned, riſes in a conical ſummit, about 3300 feet, groteſquely adorned with churches and monaſteries. The grotto of Antiparos, one of the Cyclades to the weſt of Paros, has been well deſcribed by Tournefort, and recently by an ingenious female traveller.[1] The iſle of Antiparos is a rock of fine marble, about ſixteen miles in circumference. In the ſouthern part of this iſland, about a mile and a half from the ſea, riſes a rugged cavern with ſome ancient inſcriptions. After proceeding about twenty paces appears a dark and low paſſage, whence the traveller, being provided with lights, deſcends by a rope, and afterwards by a ladder placed by the ſide of deep abyſſes. The path now becomes more eaſy, and conducts to another ſteep precipice, which is deſcended by another ladder. After much fatigue, and ſome danger, the traveller at length arrives in the grotto, which is ſuppoſed to be about 900 feet from the firſt opening.[2] Tournefort eſtimates the height of the grotto at about 40 fathoms. The ſtalactitic marble hangs from the roof, in the moſt elegant and pictureſque forms: and on the floor are large maſſes of ſtalagmite, browniſh and leſs pure, produced by the liquified ſtone dropping from above; but Tournefort, a botaniſt, very naturally ſuppoſes that they vegetate.[3] A great diſtinction between this grotto, and others of a ſimilar kind in England and other countries, is the purity of the material, being marble of a ſnowy whiteneſs, and the fineſt calcareous ſpar. The marble of Paros has been known and celebrated ſince the claſſical times, as the moſt pure that the ſculptor can employ; but ſome prefer that of Carrara as of a finer and cloſer grain, and more obedient to the chiſel, the Grecian having a large cryſtalline grain, apt to ſlit off more largely than required.

[1] Lady Craven.

[2] But this muſt include all the windings, for Lady Craven computes the direct diſtance at only 300 feet, p. 247.

[3] Vol. i. 148.

ISLANDS

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ISLANDS


Dobruna
Vascogoli
Bilishra
Korcha
Castoria
Vertia
Salonica
Cavalla
Lagos
Ortona
Polina
Nizvoro
Ghermarh
Bahiserti
Yanina
Soli
Arta
Vonitsa
Prevesa
Argos Plain
Prezina
Orest
Talanda
Salona
Carti
Livadia
Thebes
Lefsina
Corinth
Cadenna
Domeko
Leptina
Magnesia
Sardes
SMYRNA
Philadelphia
Gusulhisar
Thyllies
Cuyupasch
Melasso
Cyzicus
Lake Apollonia
GREECE

ISLANDS BELONGING TO TURKEY IN EUROPE.

The numerous islands in the Archipelago are by geographers considered as belonging to Europe; except a few which approach the Asiatic shore, as Mytilene, Scio, Samos, Cos, and Rhodes. Islands.

The classical islands of ancient Greece have been so repeatedly described, that little more than an enumeration may suffice. The largest is that of Crete, or Candia, which is about 180 British miles in length, by 40 at its greatest breadth. A chain of high mountains, called the White Mountains from the snow, pervades a great part of its length.[4] The inhabitants are vigorous, and robust, and fond of archery. This isle abounds with cattle, sheep, swine, poultry and game, all excellent; and the wine is balmy and luscious. The dogs of Crete are ugly; and seem to be between the wolf and the fox. The siege of Candia by the Turks, in the middle of the seventeenth century, is memorable in modern history, as having continued for 24 years, 16[illegible]–1670. This island had before flourished under the Venetians. Crete.

Next is Negropont, about 100 British miles in length by 20 in breadth; a large and important island, which also belonged to the Venetians to a late period.*

The other isles are generally of a diminutive size; and were divided by the ancients into separate groups, of which the Cyclades were the most memorable; while the Sporades approached the Asiatic shore. Other chief names are Lemnos, Skyro, and Andro. It is unnecessary to give a tedious repetition of the births of illustrious classics, and other trivial particulars concerning these islands; and the grotto of Antiparos is de-

[4] Tournefort, i. 69, &c.

* The isles of Corfou, Cefalonia, and Zante, on the other side of Greece, were on the fall of Venice seized by the French; but now constitute an independent republic, under the protection of Russia; a curious experiment on the genius of modern Greece.

ISLANDS. ſcribed in the account of natural curioſities. It muſt not however be omitted, that in the year 1707 a new iſland aroſe from the ſea, with violent volcanic exploſions, near Santorine, and about a mile in diameter.* The other iſlands ſhall be briefly deſcribed under their proper diviſion of Aſiatic Turkey.

* The curious reader may find a long detail of this ſingular event in Payne's Geographical Extracts, p. 252 to 256.

however be
, with vio-
diameter,*
division of

ographical Ex-


HOLLAND
Vlieland
Der Scheling
Texel
EAST FRIESLAND
EMDEN
Waard
LEEWARDEN
Tzimarker
Bolsvert
FRIESLAND
GRONINGEN
Espenburg
Schagen
Dregter
Land
Middel Kogt
Hoorn
Alkmaar
Zwolle
Kampen
Deventer
Hasselt
Naerden
Amersfoort
Quarter of Arnhem
UTRECHT
Weluwe
Over
Warfsier
Drostamp
Arnheim
Quarter of Zutphen
Delft
Leyden
Gouda
Rotterdam
Dordrecht
Tiel
NIMEGUEN
Waal
Cleve
Heerlijk
Land of Ravenstein
Kuik
Of Wesel
Bois le Duc
Hertogenbosch
Breda
Bergen op Zoom
Goes
South Beveland
Of Bergen
Meurs
Lingen
MUNSTER

SECONDARY STATES.

SUCH have been for a ſeries of ages, and ſuch will probably continue, in ſpite of temporary fluctuations, to be the primary and leading ſtates in Europe. Pruſſia alone may be regarded as a new power; but it repreſents Poland, formerly in the firſt claſs. A ſecondary ſtate may diſtinguiſh itſelf by commerce and marine enterpriſe, as Portugal or Holland; or by momentary ebullitions of warlike ſpirit, like Sweden; but ſuch accidental circumſtances do not change the political order, which depends upon extent of territory and population.

According to the plan of this work, the deſcription of the ſecondary ſtates ſhall be reſtricted to more confined limits.

HOLLAND.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progreſſive Geography.—Hiſtorical Epochs and Antiquities.

THE SEVEN UNITED PROVINCES were, in ancient times, chiefly poſſeſſed by the Batavi, a people highly celebrated by Tacitus: but the boundaries being modern, there is no ancient appellation which particularly denotes this country. It is commonly ſtyled the republic of NAMES.

NAMES. of Holland, from the name of a chief province; so called from the German word *Hohl*, corresponding with the English word hollow, and implying a concave or very low country. The people are called Dutch from the German *Deutsch* or *Teutsch:* but *Deutschland* properly signifies the vast extent of Germany itself, though by the English restricted to a small portion using a dialect of the German language.

Extent. These provinces extend, from the N. of Groningen, to the southern boundary along Austrian Flanders and Brabant, about 150 British miles; and in breadth, from what is called the North Sea to the circle of Westphalia, about 100 British miles. The number of square miles is computed at 10,000.

Original Population. The original population appears to have been Celtic: but when the Romans conquered this country the chief inhabitants were the Batavi, the most northern people of Belgic Gaul, and incontestibly a German or Gothic progeny. The Franks passed the Rhine to the south of the Batavi; who appear to have been secure in their marshes and islands, till the Frisians, the next adjacent people in the north, in the seventh century extended themselves even down to the Scheld. In the eighth century the Frisians were subdued by the Franks under Charles Martel; but the Frisians and Franks may be regarded as mingled in the population with the ancient Batavians.[1]

Progressive Geography. The progressive geography of this region becomes curious and interesting, from the singular phenomenon of the increase of the sea. Upon inspecting the accurate maps of the ancient and middle geography of Gaul by D'Anville, it will be perceived that the Rhine divided itself into two grand branches at Burginasium or Schenk, about five miles N. W. of the Colonia Trajana, now an inconsiderable hamlet called Koln near Cleves. The southern branch received the Meuse, still an inferior stream, at the town of Mosa or Meuvi; while the northern passed by Durstadt, Utrecht, and Leyden, into the ocean. From the northern branch was led the canal of Drusus, which originally joined the Rhine to the Issil, a river that flowed into a considerable inland lake called Flevo, now a southern portion of the Zuyder Zee. This canal of Drusus being neglected, and left to the operations of nature, the Rhine joined the Issil with such

[1] D'Anville Etats form. en Europe, p. 26.

 force

force that their conjunct waters increaſed the lake of Flevo to a great extent; and inſtead of a river of the ſame name, which ran for nearly 50 Roman miles from that lake to the ſea, there was opened the wide gulph which now forms the entrance. This northern and chief mouth of the Rhine was, at the ſame time, weakened and almoſt loſt by the diviſion of its waters, and even the canal of Druſus was afterwards almoſt obliterated by the depoſition of mud in a low country, in the ſame manner as ſome of the ancient mouths of the Nile have diſappeared in the Delta of Egypt.

PROGRESSIVE GEOGRAPHY.

The ſouthern branch of the Rhine, which received the Meuſe, as above mentioned, was anciently called Vahalis, a name retained in the modern Waal; the ancient iſle of the Batavi being included between the two branches of the Rhine, and thus extending about 100 Roman miles in length by about 22 at the greateſt breadth. The eſtuaries of the Rhine and the Scheld have alſo been opened to great inroads from the ocean: and the latter in particular, which anciently formed a mere delta, with four or five ſmall branches, now preſents the iſlands of Zealand, and the moſt ſouthern of thoſe of Holland, divided by wide creeks of the ſea. This remarkable irruption is ſuppoſed to have happened at the time that the Goodwin Sands aroſe, by the diffuſion and conſequent ſhallowneſs of the water. Theſe great changes may be conceived to have made a ſlow and gradual progreſs: and none of them ſeem ſo ancient as the time of Charlemagne, Some of them are ſo recent as the fifteenth century; for in 1421 the eſtuary of the Meuſe, or Maeſe, or rather the Rhine, ſuddenly formed a vaſt lake to the S. E. of Dort, overwhelming 72 large villages, with 100,000 inhabitants, who periſhed in the deluge.[2]

By a ſubſequent change the Rhine was again ſubdivided; and a chief branch became the Leck, which name is loſt, between Dort and Rotterdam, but muſt now be regarded as the northern mouth of that noble river; while the Vahalis or Waal continues to be the ſouthern.

[2] Cluver. 96. Guicciardini, 271. Some authors arbitrarily aſſign theſe changes to violent tempeſts, A. D. 860; others to 1170. Guicciardini, p. 13. A Zealandic chronicler, quoted by the ſame author, 346, ſays that the iſlands of Zealand were formed by violent tempeſts in the year 938, a date which ſeems to deſerve the preference.

In

Historical Epochs.

In popular acceptation, both are loſt in a comparatively ſmall ſtream, the Meuſe, which, in fact, only runs into the ſouthern branch at the iſle of Bommel; but the preciſion of ſcience rejects this ridiculous error. The leſs important variations in the geography may be traced with ſome preciſion in the Francic hiſtorians, and other writers of the middle ages.

Among the chief hiſtorical epochs may be numbered,

1. The actions of the Batavi in the Roman period, from the firſt mention of that nation by Julius Cæſar.

2. The conqueſt by the Friſians; and afterwards by the Danes, and by the Franks.

3. The countries watered by the Rhine and the Meuſe were for a long time divided into ſmall earldoms; but in the year 923 Theodoric or Diedric, brother of Herman duke of Saxony, and of Wickman earl of Ghent, was appointed count of Holland by Charles the Simple king of France, and the title became hereditary. Zealand and Friſland were included in the donation. The county of Gelderland on the E. was erected by the emperor Henry IV in 1079; and became a duchy in 1339. Utrecht was ſubject to its powerful prelates, who had frequent conteſts with the earls of Holland.

4. Florence III, who ſucceeded in 1187, carried on numerous wars againſt the Flemings and Friſians; and died at Antioch, in 1189, on an expedition to the Holy Land. He married Ada, grand daughter of David I king of Scotland, a country which had early commercial connexions with Holland. In 1213 William I earl of Holland formed a league with John king of England, Ferrand earl of Flanders, and the emperor Otho, againſt France; but William was taken priſoner at the famous battle of Bouvines.

5. William II earl of Holland was elected by a party emperor of Germany A. D. 1247; but his claim was not crowned with ſucceſs. John earl of Holland, A. D. 1296, wedded Elizabeth daughter of Edward I of England. Frequent conteſts appear between the earls of Holland and thoſe of Flanders, concerning the poſſeſſion of the iſlands of Zealand. Philipina, daughter of William III earl of Holland, is married to the Prince of Wales, afterwards Edward III of England, a

princeſs worthy of an heroic huſband. This king afterwards conteſted the earldom of Holland with Margaret his ſiſter-in-law. Jacquelin the heireſs of Holland in 1417 wedded John IV duke of Brabant; but her uncle John of Bavaria, who had reſigned the biſhoprick of Liege in the hopes of eſpouſing her, conteſted the ſucceſſion. A kind of anarchy following, Jacquelin went to England, where ſhe married in 1423 Humphry duke of Glouceſter; and this marriage being annulled by the pope, ſhe wedded in 1432 Borſelen Stadtholder of Holland; and the next year was forced to reſign her ſtates to Philip the Good duke of Burgundy. Historical Epochs.

6. Holland, with other large poſſeſſions of the houſe of Burgundy, fell by marriage to the houſe of Auſtria.

7. Holland and ſome inferior provinces revolt from the tyranny of Philip II in 1566; and in 1579 formed the famous union of Utrecht in ſtrict alliance. The hiſtory of this intereſting ſtruggle has been depicted in glowing colours by the celebrated Grotius, who in this work ſometimes rivals the acute brevity of Tacitus.

8. At the end of that century the Dutch had eſtabliſhed colonies at the Cape of Good Hope, and in the Eaſt Indies; and ſettlements were afterwards gained in S. America. During the ſeventeenth century they rivalled the Engliſh in the empire of the ſea; and greatly exceeded them in commercial advantages. Their power began ſomewhat to decline after the obſtinate naval conflicts in the time of Charles II. In 1672 Louis XIV invades Holland; and Amſterdam is only ſaved by opening the ſluices.

9. William ſtadtholder of Holland aſcends the throne of England 1688; and a ſtricter intercourſe prevails between the countries, Holland becoming the grand channel of the commerce of England with the continent.

10. The ſtadtholderate declared hereditary 1747. The war in 1756 opening great connexions between Holland and France, a French party began to form in the country, which oppoſed the ſtadtholder, who was ſupported by the Engliſh. In 1780 a war aroſe between Great Britain and Holland, which cloſed in 1784, after expoſing to Europe the decline and weakneſs of the United Provinces, ſtill further diſplayed by the

Historical Epochs.

the entrance of the duke of Brunſwick in 1788, who may be ſaid to have ſubdued them without a blow.

11. The Dutch having joined the coalition againſt the French, their country fell a prey to the invaders, during the hard froſt of the winter 1794-5; and the ſtadtholder took refuge in England in 1795. Though a ſeparate government continue, yet the United Provinces muſt be conſidered as ſubject to France, which has annexed to her territory a portion of the parts S. of the Rhine. The Dutch fleet has ſince been nearly annihilated by the Engliſh.

Antiquities.

The ancient monuments of the United Provinces are far from being numerous or intereſting. The chief remain of the Roman period is the ruined tower near Catwick, about ſix miles N. W. from Leyden, at the ancient mouth of the Rhine. This place is commonly called Brittenburg, and is ſuppoſed by ſome to have been erected by Caligula. An inſcription evinces that it was reſtored by Severus. The Dutch antiquaries have publiſhed ſeveral inſcriptions, engraved ſtones, little images, and other curioſities found in theſe ruins.[1] Some inſcriptions have alſo been diſcovered in the territory of Nimeguen, and a Roman mile ſtone in the vicinity of Derft. In the middle of Leyden, upon an artificial hill, ſtands a round tower, fabled to have been built by Hengiſt who firſt led the Saxons to England. Among the antiquities of the middle ages may be particularly named the church of Utrecht, with a tower of great height, commanding as it were a map of the ſurrounding country, and worthy of the great power of the ancient biſhops of that ſee. But Amſterdam itſelf, and moſt of the other cities, are comparatively of recent foundation, and contain but few monuments even of the middle ages.

[1] Junii Batavia, p. 200. Scriverius, 176.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

THE protestant religion, in the Calvinistic form, prevails through the United Provinces; and the treaty of Union 1579 bears that it shall be maintained. The states of Holland, in 1583, proposed that no other form of worship should be tolerated; but this resolution was wisely rejected: and every religion is permitted, on condition that it do not oppose the fundamental laws, or teach any doctrines subversive of the state; yet employments of any consequence can only be filled by protestants.[1] RELIGION.

The ecclesiastical persons are considered as divided into four ranks, professors at universities, preachers, elders, and deacons: and the government of the church is administered by consistories, classes, and synods. The consistory is the lowest court, commonly consisting of the clergy and elders of a particular town, while a class consists of deputies from several, and is commonly assembled three times in the year, a part of its duty being to visit the churches, and watch over the conduct of the clergy. The synods are either provincial or national; the first being assembled every year, while the national synod is only summoned on the most important occasions, when essential doctrines are to be discussed, and the last was that of Dort 1618. The provincial synods are: Ecclesiastic Geography.

	Classes.	*Preachers.*
1. That of Gelderland - - -	9	285
2. That of Southern Holland - -	11	331

[1] Busching, xiv. part ii. p. 16.

 3. That

Ecclesiastic Geography.

	Classes.	Preachers.
3. That of Northern Holland - -	6	220
4. The congregation of Zealand - -	4	163
5. The Synod of Utrecht - - -	3	79
6. That of Frisland* - - - -	6	207
7. That of Ober Yssel - - - -	4	84
8. That of Groningen, the city and low countries - - - -	7	161
9. That of Drent - - - -	3	40
Total	53	1570

There are, besides, numerous Walloon churches, scattered through the provinces, who hold a kind of synod twice a year, composed of deputies from their own sect. The Roman Catholics are supposed to have 350 churches, served by 400 priests, exclusive of some in the conquered territory. The chief other sects are the Lutherans, the Remonstrants, or Arminians, who have forty-three teachers, Anabaptists, and Jews, and a few Quakers.

Government.

The United Provinces were composed of seven republics, each retaining its own states, consisting of nobles, and burgesses. The provincial states send deputies to the states-general, each republic having only one vote, though its deputies may be numerous. But the states-general seldom exceed 26 persons, who used to assemble in a small room at the Hague, enjoying the right of peace and war, appointing and receiving ambassadors, naming the Greffier, or secretary of state, and all the staff officers.[1] The council of state directs the army and finances; and what is called the council of deputies considers the troops and finances of each province. The grand pensionary of Holland presides in the provincial states, and council of deputies of that country. The Stadtholder was originally a kind of dictator, appointed, from the

* That is Frisland Proper. West Frisland is to the north of Holland on the west of the Zuyder Zee. East Frisland to the east of Groningen. See Nugent, ii. 381.

[1] Radcliffe's Travels, i. 53. Busching, xiv. p. 40, &c.

GOVERNMENT.

neceſſity of the times, to conduct the emancipation of the ſtate. The neceſſity having vaniſhed, this office became of dubious authority, till William III, in 1672, procured it to be declared hereditary. As he died without children the ſtates ſeized this power till 1747, when, the French penetrating into Dutch Flanders, the rank was reſtored to William IV, and again became hereditary, though in recent times frequently conteſted.

Theſe induſtrious provinces have been recently erected into a kingdom, and aſſigned by the French emperor to his brother Louis. How far this change may be acceptable to the inhabitants muſt be left to time to verify. A more juſt and natural connection would have been the incorporation of the country, as far as the Rhine (that is as far as the Leck, and what is called the mouth of the Meuſe, though in reality that of the Rhine,) with the Pruſſian dominions. The identity of the proteſtant religion, and other advantages, rather invited this change: not to mention the neceſſity of enlarging the baſis of the Pruſſian power, in order to eſtabliſh any reſemblance of a balance in Europe.

The new conſtitutional code conſiſts of five parts, or rather ſhort chapters. The civil, religious, and political inſtitutions are continued; and the public debt guaranteed. The council of ſtate is to conſiſt of thirteen members. All the religions are tolerated, even that of the king; who is to nominate to all offices and places formerly in the gift of the grand penſionary, for no alluſion is made to the Stadtholder. The coin is to be ſtamped with his effigy; and he can pardon offences with the advice of the privy council. The government of the colonies is ſpecially and excluſively veſted in him; while the general government of the kingdom is committed to four miniſters of ſtate. The legiſlative body is to conſiſt of thirty-eight members, choſen for five years in the following proportion:

For Holland	17	For Zealand	2
For Guelderland	4	For Groningen	2
For Brabant	4	For Utrecht	2
For Frieſland	3	For Drenthe	1
For Overyſſel	3		

The

Government.

The title of High Mightineſſes is retained for the aſſembled members of the legiſlative body, the late grand penſionary being declared preſident for life. This aſſembly meets twice in the year, in April and November, but extraordinary aſſemblies may be ordered by the king.

Such are the leading articles of the new conſtitution; but as the king remains a grand officer of the French empire, and the military are chiefly French, theſe celebrated provinces may be conſidered as in a ſtate of ſubjection. In an extenſive and hiſtorical point of view the preſence of a king and court may be regarded as ſerviceable to the reputation and even intereſts of the country; and if Holland had been aſſigned to Pruſſia, the preſence of a prince of that country would have been advantageous. For it is not without reaſon that many travellers have imputed a ſordid ſpirit of avarice to the Batavians; and the preſence of a court can alone, in ſome degree, rectify this ſpirit, by a greater promptitude and liberality in the executive government, and by the encouragement of the arts and ſciences, which might periſh by the neglect of individual avarice. A ſpirit of glory and emulation may alſo be thus introduced or increaſed, which may counteract the vile ſpirit of avarice and ſordid enjoyment, the moſt ignoble of all the paſſions.

Laws.

Juſtice is adminiſtered according to the local cuſtoms and ſtatutes of each province and city, the ordinances of the ſtates general, and in defect of all theſe the Roman code. Each province has a ſupreme court, to which appeals lie from the lower courts of Juſtice, except in criminal cauſes, in which the Stadtholder might pardon, by the conſent of the preſident and ſuperior court of each province, ſave in caſes of murder and other flagrant crimes.

Population.

The population of the United Provinces has been recently computed at 2,758,632,* and the extent of the territory in ſquare miles being ſuppoſed 10,000, there will be 275 for each mile ſquare. The population of Holland, the chief province, is calculated at 980,000.

Colonies.

The Dutch being, for a conſiderable time, the chief maritime power in Europe, their colonies were numerous; beſides ſome ſettlements on the coaſt of Hindoſtan, and an important eſtabliſhment in Ceylon,

* After the diſmemberment 1,881,881, by the French accounts.

they held, and ſtill retain Batavia in the iſland of Java. But the Cape of Good Hope, and other conſiderable eſtabliſhments have fallen into the hands of the Engliſh, and the Dutch colonies may be conſidered as nearly annihilated. Colonies.

The army was computed at about 36,000, but it is now incorporated with that of France. The navy, which uſed to conſiſt of forty ſhips of the line, has by the events of the laſt war almoſt totally diſappeared. Army.

The revenue was about three millions and a half ſterling, but was greatly exceeded by the expenditure; ſo that the national debt was computed at about 130,000,000l. ſterling: but 2,800,000l. were annually received as the intereſt of loans to foreign powers.* Revenue.

The political importance and relations of the United Provinces are at preſent completely immerged in thoſe of France. Any conſequence among the European powers can ſcarcely be reſumed, except by the hopeleſs union with the other Netherlands: but the moſt natural and neceſſary political relations are with England, under whoſe protection they might ſtill have aſpired to lucrative commerce. Political Importance, &c.

* The dilapidation of the revenue has become very apparent ſince the nominal monarchy.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Customs.—Language.—Literature.—Education.—Universities—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

A STRANGER visiting Holland is surprized at the extreme cleanliness observable in the houses and streets, even hamlets inhabited by poor fishermen, displaying a neatness and freshness, which forms a striking contrast with the squalid appearance of the German villages. The air being always moist, and commonly cold, the Dutch dress is calculated for warmth and not for elegance. Yet the people are fond of splendid exhibitions, and remarkably submissive to their superiors.[1] The Dutch are of a phlegmatic temperament; and their courage at sea is rather obstinacy than ardour; while from the same cause their labour is rather slow perseverance, than impetuous strength like that of the English. In former times their knowledge was chiefly restricted to two channels; affairs of state, on which even the vulgar would converse with propriety; and the arts of getting money. But, as usual in the decrepitude and fall of a state, as well as in the old age of the individual, the miserable love of money at length supplanted every noble thought and generous feeling. This striking characteristic has impressed every spectator, from the days of Ray the naturalist, who visited Holland in 1663, even to the present hour. A late amiable traveller observes that "the infatuation of loving money not as a mean but as an end, is paramount in the mind of almost every Dutchman, whatever may be his other dispositions and qualities; the addiction to it is fervent, inveterate, invincible, and universal, from youth to the feeblest old age."[2]

[1] Ray, 53. [2] Mrs. Radcliffe, i. 98.

The

The Dutch are commonly low in ſtature, and the women are taller than the men. The ſex having generally few perſonal advantages, they are induced to make advances, which impreſs foreigners as immodeſt and improper. The Dutch dreſs is little affected by faſhion, and the women retain the old broad hat, while that of the men is narrow and compact; nor has the ancient female affection for gold and jewels been eradicated by the avarice of fathers and huſbands. The uſe of ſalt and high-ſeaſoned food is perhaps enforced by the humid climate, as well as that of ſpirituous liquors. Beſides the uſual games, the chief amuſements were the theatres, and the tea-gardens. The opulent merchants delighted in their villas, thickly planted among the numerous canals; and the ſmallneſs of the gardens was compenſated by the richneſs of the miniature ſelection, in which perhaps one tulip root might coſt 50 guineas. The Dutch perſeverance is alſo diſplayed in the improvement of hyacinths, and other flowers, cultivated with great attention becauſe there was not room for the grander vegetables. In the winter ſkating was alſo a favourite amuſement, and the canals were crowded with all ranks, from the ſenator to the milk maid with her pail, and the peaſant with his eggs. But the chief amuſements, in ſo moiſt a climate, were under the ſhelter of the domeſtic roof, in large and expenſive collections of paintings and prints, which alſo became an article of commerce and avarice. Manners and Customs.

The Dutch language is a dialect of the German; and the Lord's Prayer runs in the following terms: Language.

Onſe Vader die daer zijt in de Hemelen. Uwen Naem word gheheylight. U Rijcke kome. Uwen Wille gheſchiede op der Aerden, gelijck in den Hemel. Onſe dagelijckt Broodt gheeft ons heden. Ende vergheeſt ons onſe Schulden ghelijck wy oock onſe Schuldenaren vergeven. Eude en leyt ons niet in Verſoeckinge. Maer verloſt ons vauden Booſen. Amen.

The literature of the Seven United Provinces is more reſpectable than that of the other Netherlands. Not to mention the ancient chronicle of the church of Utrecht, written by Beka in the thirteenth century, and other eccleſiaſtical productions of the middle ages, the great Eraſmus, the reſtorer of letters in Weſtern Europe, was born at Rotterdam in 1467. Johannes Secundus, or Hans de Twede, one of Literature.

LITERATURE.

the moſt elegant of modern Latin poets, was a native of the Hague, as the renowned Grotius was of Delft. Boerhaave, the celebrated phyſician, was born at Voorhoot near Leyden. Dort produced Paul Merula, a diſtinguiſhed antiquary, who at the beginning of the ſeventeenth century firſt diſcriminated the real origins of European nations. Adrian Junius, or Yung, who explored the antiquities of his native country, was of Hoorn on the Zuyder Zee. Among other eminent names may be mentioned Meurſius of Lauſden, Douſa of Leyden, Heinſius of Ghent, and the younger Voſſius, for the father was of Heidelberg. Hoogeveen of Leyden died in 1794, after having acquired the reputation of being the firſt Greek ſcholar in Europe. This liſt might be eaſily encreaſed; but it ſhall ſuffice further to obſerve that the native literature has not been entirely neglected, ſince the time of Catz the poet, a native of Zealand, who flouriſhed in the middle of the ſeventeenth century; and that ſeveral works of utility and amuſement have been publiſhed in the Dutch language, which ought to ſhare with the German the attention of lovers of literature.

Education.

The mode of education purſued in theſe provinces ſeems to have been greatly inferior to that uſed in Scotland, a country enjoying an eccleſiaſtic government ſomewhat ſimilar. The Dutch youths being chiefly allotted to a ſeafaring life, there was not indeed that opportunity for numerous parochial ſchools, and conſequent diffuſion of common knowledge, which took place in Scotland. The moſt large and celebrated Latin ſchools were at Rotterdam, Breda, Middleburg, Groningen, &c. The univerſities are five; Leyden, Utrecht, Harderwyck, Franecker, and Groningen; with two inferior colleges at Amſterdam and Deventer. There is an academy of ſciences at Haarlem.

Univerſities.

Cities and Towns.

Amſterdam.

Amſterdam, the chief city of Holland, upon the ſmall river Amſtel, is firſt mentioned in the thirteenth century; but in the fourteenth was reckoned among the commercial towns of Europe. About the middle of the ſeventeenth century, during the higheſt proſperity of the republic, it was enlarged by about one half. The haven is not diſtinguiſhed by natural advantages, but has been improved and ſecured by art: and the wide foreſt of maſts impreſſed every traveller with amazement. The population is computed at about 212,000. The ſtreets are

are generally narrow, and the canals feculent. The houfes have the common air of neatnefs peculiar to thofe of the Dutch. The chief edifices are the ftate houfe, founded on piles at an immenfe expence; the exchange, and the poft office; but fome ftreets along the chief canals difplay houfes of uniform grandeur. Some agreeable walks occur in the interior of the city; but the environs are chiefly vifited by water; yet to the S. there is an agreeable road to Ouderkirk through pleafant gardens and groves.[3] CITIES AND TOWNS.

Leyden is efteemed the next city in population, containing about 50,000 fouls. It is the Lugdunum Batavorum of antiquity, and is diftinguifhed by its univerfity. Here the ancient Rhine almoft expires in a number of fmall channels, which are paffed by fo many bridges, that the number has been computed at more than one hundred. The meadows and gardens around Leyden are remarkably productive, and there is a daily intercourfe, by canals, with the other chief cities and provinces. The fair is ftill much frequented; but the univerfity has declined under fome commercial regulations, for the Dutch always wish to oblige ftrangers to leave as much money behind them as poffible.[4] Leyden.

Next in population is Rotterdam, of about 48,000 people. There is a noble quay, with houfes as handfome as any in the fquares of London; and the great length of the ftreets is characteriftic of Dutch cities, and even towns; yet they are generally narrow, and the foot pavement is only diftinguifhed by a clean line of bricks.[5] In the market place ftands the well-known ftatue of Erafmus. The canals, terraces, and draw-bridges are engaging objects; but there is little of real elegance, and the Dutch idea of beauty is what we ftyle prettinefs. Yet where this prettinefs leads to extreme neatnefs, it is preferable to fqualid grace. Rotterdam.

Haarlem is computed to contain 40,000 fouls; and, like Leyden, is fortified by old brick walls, the modern plan of earthen barriers, in which the cannon balls fink innoxious, being little known till towards the middle of the feventeenth century. The great church is efteemed Haarlem.

[3] Radcliffe, i. 108. [4] Ib. i. 89. [5] Ib. i. 16.

Cities and Towns.

the largeſt in the province of Holland; but the celebrated organ is more remarkable for power than ſweetneſs. The houſe of Lawrence Coſter, whom the Dutch fondly aſſert to have been the inventor of the grand art of printing, ſtands near the church; but impartial enquirers have decided the queſtion in favour of Mentz.

Hague.

The Hague is only eſteemed a village, though the inhabitants be computed at 36,000. The court, or palace, contains ſeveral chambers allotted to the different branches of government, beſides the apartments of the Stadtholder. The ſtates general met in a room which contained twenty-ſix chairs, for the uſual number of the members.* The cabinet of natural hiſtory has been carried to France, and probably the moſt curious books and pictures. It is aſſerted that the Hague contains more magnificent houſes, than occur in the like ſpace in any city of northern Europe. On the N. of the town is a noble grove, with alleys of oak and beech, leading to the Maiſon du Bois, a palace of the Stadtholder; but the pleaſanteſt road is that to Schevening, a village on the ſhore two miles to the N. W. through four rows of loſty elms. The Hague is diſtinguiſhed by its pleaſant ſituation, and tranquil grandeur.

Middleburg in Zealand is ſuppoſed to contain 30,000 inhabitants; and it has a large town houſe, decorated with the ſtatues of the ancient earls and counteſſes of Holland. It was not only the ſeat of the provincial ſtates, but alſo of the council of Flanders, preſiding over part of that country acquired by the Dutch. Utrecht, Delft, Dort, and Groningen, are ſuppoſed each to contain about 20,000 inhabitants: and among the inferior cities may be named Maeſtricht, the moſt ſouthern of the Dutch poſſeſſions, ſituated on the river Maeſe, or Meuſe, 18 Britiſh miles N. W. of Aken, or Aix la Chapelle, and ceded to the Dutch, after repeated conteſts, by the peace of Nimeguen 1678: in the vicinity are vaſt ſtone quarries ſupported by numerous pillars, which might ſhelter thouſands from the horrors of war.

Maeſtricht.

Inland Navigation.

To enumerate the canals of the United Provinces would be infinite, for they equal the roads in other countries; and the advantage muſt be the more perceived during the interruption of maritime commerce, by

* Radcliffe, i. 49.

the

the increaſe of the inland trade with Germany, the ſouthern Netherlands, and France. INLAND NAVIGATION.

The chief manufactures of Holland are linens, many of which however are made in Sileſia, pottery, and painted tiles, eſpecially at Delft; leather, wax, ſnuff, ſugar, ſtarch, paper, beſides ſome of woollen, cotton, and ſilk. But the moſt precious branch of commerce conſiſted in ſpices and drugs, brought from the ſettlements in the E. Indies; and the Dutch E. India company was, for a conſiderable time, the greateſt mercantile firm in Europe. The fiſhery in the Northern ſeas, and even on their own and the Engliſh coaſts, was alſo an object of great commercial importance. Latterly perhaps the chief advantage was derived from Holland being the grand depoſit of commerce between Great Britain and the continent, particularly Germany and France. The inland trade with Germany, by the canals and the Rhine, is almoſt the only branch which has eſcaped the ravages of war, and may even now be regarded as conſiderable. Of this the moſt remarkable feature conſiſted in the vaſt floats of timber, which arrived at Dort from Andernach, and other places on the Rhine, whoſe copious ſtream received the trees of the German foreſts. The length of theſe rafts is from 700 to 1000 feet, the breadth from 50 to 90; and 500 labourers direct the floating iſland, which is crowded with a village of timber-huts for their reception. The navigation is conducted with the ſtricteſt regularity; and on their arrival at Dort the ſale of one raft occupies ſeveral months, and frequently produces more than 30,000l. ſterling.[7] The other branches of inland traffic are numerous: and the Rhine may be ſaid to ſupply Holland with inſular advantages, ſecure from the deſtructive inroads of maritime war. Manufactures and Commerce.

[7] Radcliffe, ii. 114.

CHAPTER. IV.

NATURAL GEOGRAPHY.

Climate and Seasons. — Face of the Country. — Soil and Agriculture. — Rivers.— Lakes. — Mountains. — Forests. — Botany.—Zoology.— Mineralogy.— Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

HUMIDITY and cold are the chief characteristics of the climate of the United Provinces. The general face of the country is that of a large marsh which has been drained; the canals, and even the sea, looking pale and discoloured by mud; but the numerous and important cities and towns excite admiration, and the most dignified ideas of the wonderful powers of industry, which seems to have selected a chief seat amidst the greatest natural disadvantages. And even among these marshes the eye is relieved by the groves, gardens, and meadows; and to the E. of Utrecht the woods and hills gently swell towards Germany. Yet the east even of Dutch Brabant is disfigured by the large morass of Peal, extending about 30 British miles in length: Over-Yssel, so called from its western boundary of the Issel, which received the canal led by Drusus from the Rhine, is almost wholly composed of enormous marshes and heaths; and the morass of Bourtang rivals that of Peal in extent. The northern provinces of Frisland and Groningen, (parts of the ancient Frisia which included also the principality of E. Frisland now belonging to Prussia,) present towards the S. and S. E. extensive heaths; while the parts towards the sea rival the morasses of Holland. Thus the whole country may be said to display an intimate combination of land and water; and the few elevations commonly consist of barren sand.*

* It is somewhat remarkable that the Zuyder Ze should be frequently frozen, Nugent, ii. 385; probably owing to the shallowness of its waters.

The

The agriculture of ſuch provinces cannot be expected to be conſiderable, the land being moſtly under paſturage, except a few crops of madder, and tobacco, which are cultivated with great predilection. In the province of Gelderland, and the barony of Breda, there were waſte grounds of ſome extent, over-run with broom and heath, the ſoil generally a black ſand, which ſeem to have been neglected as approaching to the frontier. The paſturages in the N. of Holland, eſpecially thoſe of Bemſter, and in Friſland, ſupplied ſuch quantities of excellent butter, as to become a ſtaple article of commerce. The cows ſeem to have been originally from Holſtein, and the utmoſt attention was paid to warmth and cleanlineſs, ſo that even in ſummer the animals appeared in the meadows cloathed with ludicrous care.[1] It was probably known from experience that the climate was too moiſt for wheat, and too cold for rice; and paſturage being preferred to inferior crops, the ſmall portion of fertile land was divided into paſturage and gardens. Soil and Agriculture.

The chief rivers of the United Provinces are the Rhine, and the Meuſe. The latter, as already mentioned, has in the vulgar mouth uſurped the honours due to the majeſty of the Alpine river. But in the preciſion of ſcience the eſtuaries of the Maas, or Meuſe, ſhould be ſtyled thoſe of the Rhine, though the people accuſtomed to the ancient and more northern egreſs of this grand river have continued to prefer tradition to fact. The Leck and the Wahal muſt both be regarded as eſtuaries of the Rhine, though, after their junction, they be commonly ſtyled the Meuſe, while in juſt and preciſe geography it would be ſaid that the Meuſe now falls into the Rhine on the eaſt ſide of the iſle of Bommel. The principal river falling into the Zuyder Ze is the Iſſel, which riſes not far to the S. W. of Munſter, and after receiving the canal of Druſus near Duiſberg becomes a conſiderable ſtream. On the N. of this is the ſmall eſtuary of Wecht, which riſes to the N. of Munſter. The rivers of Friſland and Groningen are ſo diminutive that they are moſtly loſt in the numerous canals before they join the ſea. Rivers.

The lakes are of ſmall extent, if we except what is called the ſea of Haarlem, on the N. of which is the Y, a broad piece of water Lakes.

[1] This is merely a precaution againſt flies which infeſt the animals, and thus diminiſh their milk, as the author learned on the ſpot.

Lakes. passing by Amsterdam, rather wearing the semblance of a creek of the sea, than of a river: and even the Meer of Haarlem can hardly be regarded as a lake of fresh water. There are other small lakes in the N. of Holland, and in Friesland and Groningen; not to mention some amidst the marshes of Over Yssel.

Progressive Geography. Of mountains there is not the most distant semblance; and even the few hills towards the E. may more properly be denominated little elevated tracts of sand.

Botany. When it is considered that the Batavian territory is destitute of wood-lands, of mountains, and of limestone districts, it will easily be perceived in what respects its flora is inferior to that of Britain: we should search in vain among the swamps, the level meadows, or the sandy heaths of Holland for the numerous species of orchideæ, and of papilionaceous plants that inhabit the beech-woods of Sussex, and Kent, or the open chalk downs of the southern and midland counties, and though the bleak heaths of Gelder, and Overyssel may furnish a few of our mountainous plants, such as the arbutus uva ursi, and vaccinium vitis idæa; yet those that dwell by the rushing torrents of Wales and Scotland, that fix themselves to the rocky bottom of our pellucid lakes, or flourish in the cloudy solitude of Snowden, of Skiddaw, or of Ben Nevis are wholly wanting in the list of indigenous Batavian vegetables. The only plants possessed by Holland which are not found in the British islands are Isnardia palustris, trapa natans, calla palustris, vallisneria spiralis, all aquatic plants, and natives of the Rhine, and other waters in the province of Holland; and veronica peregrina, globularia vulgaris, campanula perficifolia, ornithogalum minimum, and oenothera biennis, *evening primrose*, growing on the frontiers of Brabant and Westphalia.*

Zoology. In the zoology of the United Provinces there is nothing peculiar, or worthy of remark; the horses are chiefly from England and Flanders, the oxen from Holstein. The stork is here frequent, though unknown in England. The shores abound with excellent fish, particularly turbot and soals; but the herrings, a favourite food, are derived from the northern ocean, and are chiefly brought to Flardingen, or Vlaerdin-

* De Gorter, Flora Belgica.

gen, a port on the W. of Rotterdam, ſo noted in ancient times that the earls of Holland are firſt mentioned by the ſtyle of earls of Flardingen. Zoology.

Minerals are unknown, if we except the ſlight inciſions for peat; and the land being moſtly alluvial, it is ſcarcely poſſible that any metals, or even coal, ſhould be found. In digging a well near Amſterdam ſea-ſand was diſcovered at the depth of more than 100 feet, a proof that in primitive ages the land had encroached upon the ſea, which afterwards reſumed a part of its rights. On the other hand in digging the marſhes trees have been found at a conſiderable depth, often with their heads towards the E. as if they had yielded to the fury of the weſtern winds. The umber or ligneous earth, ſometimes uſed by the Dutch to adulterate their ſnuff, is not a native product, but is brought from the vicinity of Cologne, where it occurs in vaſt beds, and is ſometimes even uſed for firing. The Dutch not only procure peat from the moraſſes, but alſo from the bottoms of the rivers by dragging up the mud, which is expoſed to dry on the ſhore, then cut into ſmall pieces, and again dried for uſe. No mineral waters are here known: and there are few uncommon appearances of nature, though the whole country may be deemed an artificial curioſity, from the number of canals, and from the vaſt dykes erected to exclude the ſea. Theſe are often protected by a covering of ruſhes, ſtrongly faſtened with wood; yet ſometimes dreadful inundations have taken place, an evil which long experience ſeems latterly to have taught them to prevent. Mineralogy. Natural Curioſities.

DENMARK.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Name.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

NAMES. THE name of Denmark, implying the marches, boundaries, or territories, of the Danes, is derived from the inhabitants, who are said to have been so denominated from one of their first leaders called Dan. Such etymologies are always uncertain; and even when clear the knowledge acquired is of no importance. The people are mentioned by the name of Danes in the sixth century, when we first begin to gain a faint idea of Scandinavia from the history of Jornandes. Norway, anciently Norrik, or the Northern kingdom, affords a palpable and precise derivation.

Extent. These kingdoms, which in former times have, by repeated emigrations, changed the destinies of a great part of Europe, and continue deeply to interest the student of history, constitute a singular expansion of territory. For from the river Elbe, in the south, to the northern extremity of Danish Lapland, and the wild environs of the river Tana, may be computed, after excluding the entrance of the Baltic, an extent of not less than 1400 British miles in length, by a

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From the Danish Map Published at Copenhagen.

Published March 1st 1802, by Cadell and Davies, Strand; and Longman and Rees, Paternoster Row.

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medial breadth of only 150. Of this great length Denmark occupies about 260 miles, while the remainder belongs to Norway. This extent of coaſt might be ſuppoſed to conſtitute a formidable naval power; but unfortunately the havens are neither numerous nor important, and are better adapted to the fleets of ſmall veſſels which formerly ſtruck Europe with diſmay, than to the pomp and magnitude of modern navigation. To the ſouth the Daniſh province of Holſtein borders on the wide territories of Germany; on the eaſt, weſt, and north, Denmark is ſurrounded by the ſea. The eaſtern limits of Norway are chiefly indicated by a long chain of mountains, paſſing between that country and Sweden.

Extent.

Boundaries.

The original population of Denmark appears to have conſiſted of Cimbri, or Northern Celts, the anceſtors of our Welch; and who in particular held the Cimbric Cherſoneſe, or modern Jutland and Sleſwick. On the progreſs of the Goths from the N. and E. the Cimbri were expelled; and being joined by part of the Teutones, or more ſouthern Germans, they were in queſt of other poſſeſſions, when they were defeated by Marius. Yet the Cherſoneſe continued to retain their name; and Tacitus mentions that in his time there exiſted a ſmall ſtate of the Cimbri, probably near the mouth of the Elbe, while the remainder of the Cherſoneſe was poſſeſſed by ſeven Gothic tribes, among which he names the Angli, who afterwards gave appellation to England, and who appear to have reſided in the eaſtern part of Sleſwick, where there is ſtill the province of Anglen. The original poſſeſſors of Norway, which, with Sweden, conſtitutes the ancient Scandinavia, appear to have been the Fins and the Laps, who were driven to the northern extremities by the Gothic invaſion, allegorically ſaid to have been conducted by Odin the God of War. The population has ſince continued pure and unmixed by foreign conqueſts; and the Norwegians ſtill retain the muſcular frame, blooming countenance, and yellow hair of the Normans, ſo well known in France, Italy, and England.

Original Population.

The progreſſive geography of Denmark may be traced with ſome preciſion from the firſt mention of the Cimbric Cherſoneſe by aſtoniſhed Rome. Pliny ſupplies ſome omiſſions in the deſcription of Tacitus, by

Progreſſive Geography.

Progressive Geography.

by mentioning the Sinus Codanus, or Baltic, and ſome bays and iſlands in this vicinity. Tacitus deſcribes the *Suiones*, anceſtors of the Danes, not of the Swedes, as imagined by careleſs geographers, as conſiſting of ſtates ſituated in the ſea, that is in the iſlands of Zeeland, and others which ſtill form the ſeat of Daniſh power.[1] He adds that they had fleets, their ſhips being of a ſingular form, capable of preſenting either end as a prow; that they had acquired wealth, and were ruled by a monarch. The whole circumſtances, as well as the courſe of the narration, might eaſily be ſhown to apply to the Danes, and not to the Swedes, who are the *Sitones* of that great writer. The progreſſive geography of Denmark may afterwards be illuſtrated from various paſſages, eſpecially from Jornandes, and the Francic hiſtorians, till Adam of Bremen, in the eleventh century, gave a minute deſcription of the country, and their own hiſtorian Saxo Grammaticus compoſed his claſſical work about the year 1180.

The geography of Norway, as may be expected, is more obſcure; nor is there reaſon to believe that any part, except its moſt ſouthern extremity, had been ſeen by the Roman mariners. It ſeems therefore a vain conception, merely ariſing from a ſimilarity of names, to ſuppoſe that the Nerigon of Pliny is Norway; and to add to the abſurdity that the city of Bergen, which was only built about the year 1070, is the Bergos of that author! The paſſage belongs to his deſcription of Britain;* and it would be more rational to enquire for theſe iſles, (for he eſpecially mentions Bergos as a ſeparate iſle,) among the Orkneys; or perhaps off the coaſt of Jutland, where it is well known that iſles have been leſſened and devoured by the fury of the weſtern waves. In his attempt to illuſtrate this ſubject, D'Anville has ſunk into the groſſeſt abſurdities; and his arguments are not only puerile, but he even corrupts the text of Pliny. Suffice it to obſerve that he extends beyond all rational bounds the ancient knowledge of Northern Europe; and ſuppoſes that the promontory of Rubeas is the furtheſt extremity of Daniſh Lapland, inſtead of a cape in the N. of Germany ſtretching into the Baltic! It is painful to obſerve ſo able a geographer following in this inſtance the dreams of Cluverius and Cellarius, while he juſtly reſtricts the an-

[1] Germ. c. 44.

* Lib. iv. c. 16. *Britannia et Hybernia.* "Sunt qui et alias prodant, Scandiam, Dumnam, Bergos: maximamque omnium Nerigon, ex qua in Thulen navigetur."

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cient knowledge of Asia and Africa. Few materials afterwards arise for the progressive geography of Norway, till the time of Jornandes; whose account is succeeded by the navigation of Ohter reported to the great Alfred, and the description by Adam of Bremen.* PROGRESSIVE GEOGRAPHY.

The chief historical epochs of these conjunct kingdoms must be separately considered, till their union in the fourteenth century.

1. The most ancient population of the continental part of Denmark by the Cimbri, who probably possessed the adjacent large isles, the ancient and chosen seat of the Danish monarchy; but of this last position there is no evidence. Historical Epochs.

2. The conquest by the Goths, who appear to have proceeded from Scandinavia into the isles, and Jutland, as the dialect differs greatly from the German Gothic, while it is a sister of the Swedish and Norwegian.

3. The Roman and Francic accounts of Denmark, from the time of Pliny and Tacitus to that of Charlemagne.

4. The fabulous and traditional history of Denmark, which extends from about the year of Christ 500 to the reign of Heriold mentioned by the Francic historians in the time of Charlemagne.

5. The conquest of Denmark by Olaf II king of Sweden, about the year 900. The Swedes appear to have been expelled by the Norwegians, for we afterwards find Hardegon of Norway king of Denmark. The Danish antiquaries have not shown much judgment in extricating the ancient history of their country, in which they should have preferred the Francic historians to the Icelandic Sagas. Some difficulties indeed arise because Jutland and the isles were occasionally divided into two monarchies; but if the Danish writers showed as much acuteness as industry the embarassments might disappear.

6. The more certain history commences with Gurm, or Gormo, A. D. 920, but there seems no evidence whether he sprung from a native race, or from the Swedish, or Norwegian. Gormo is succeeded by his son Harald Blaatand 945, who is followed by his son Swein 985, well known by his invasion of England, where he in some measure usurped the sovereignty, and died A. D. 1014.

* For the minute and recent divisions of the Danish dominions, the able work of Catteau may be consulted, *Tableau des Etats Danois*, Paris, 1802, 3 vols. 8vo.

HISTORICAL EPOCHS.

7. The reign of Canute the great, king of Denmark, England and Norway. The converſion of Denmark to Chriſtianity had commenced in the beginning of the ninth century, when St. Amſgar began to diffuſe the light of religion in Jutland; and towards the middle of that century there were churches at Sleſwick, and even at Arhus: but Chriſtianity was far from being univerſal in Denmark till the reign of Canute the great, when it was followed by its univerſal conſequences, the ceſſation of piracy and rapine, and the diffuſion of induſtry and civilization. In the year 1086 Denmark diſplayed to Chriſtendom a regal ſaint, and martyr, in Canute IV.

8. The wars of Denmark with the Wends, or Slavonic inhabitants of the ſouthern ſhores of the Baltic, who by the ignorant hiſtorians of the middle ages are ſtyled Vandals, as the Gutæ of Ptolemy are by them ſtyled Goths, whence the Swediſh Gothland inſtead of Guthland.

9. The reign of Waldemar, ſurnamed the great, A. D. 1157, who defeats the Wends in many battles, and ſubdues the iſle of Rugen. Hence followed ſlowly the converſion of Pomerania, and of the countries on the eaſt. Waldemar is regarded as the parent of the Daniſh laws. In 1223 the ſecond Waldemar, with a fleet of 1000 ſhips ſubdued a part of Livonia and Eſtonia; on which occaſion is ſaid to have been firſt diſplayed the noted banner of Dannebrog, being red with a white croſs.

10. The marriage of Hakon VI, king of Norway, with Margaret daughter of Waldemar III king of Denmark, A. D. 1363, produced the memorable union of the three crowns of the north. On the death of her young ſon, Margaret aſcended the throne of Denmark and Norway in 1387, and that of Sweden in 1389. She died in 1412; and Sweden ſoon after prepared to throw off the yoke. Her huſband, Eric of Pomerania, reigned about 26 years after her death; and was followed by Chriſtopher of Bavaria, who removed the royal reſidence from Roſkild to Copenhagen, the ſource of the elevation of the latter city.

11. The acceſſion of the houſe of Oldenburg, in the perſon of Chriſtiern I, A. D. 1448. The repeated revolts of Sweden, were ſuppreſſed by his ſucceſſor John, who was crowned at Stockholm in 1497, and

and the next year concluded an alliance with Louis XII of France, and James IV of Scotland. John had repeated wars with the Hanſeatic league, which ſupported the Swedes againſt his authority.

12. The tyrannical and unhappy reign of Chriſtiern II, when Sweden was emancipated by the efforts of Guſtaf Waſe.

13. The abolition of the Roman Catholic religion by Chriſtiern III, 1537; but the Lutheran had been already introduced in 1526.

14. The reign of Chriſtiern IV, who carries on unſucceſsful wars againſt Auſtria, and Sweden; the latter being continued by his ſucceſſor Frederic III, who was conſtrained to ſign a treaty in March 1660,* by which he abandoned to Sweden the valuable province of Scone, and other parts in the ſouth of Scandinavia, which had long remained in the poſſeſſion of the Danes, together with the fertile iſland of Rugen.

15. The memorable revolution of the 23d October 1660, by which the crown was declared abſolute and hereditary.† The ſubſequent events have been little memorable.

Of the Norwegian hiſtory the chief epochs may be conſidered in the following order:

1. The original population by the Fins and Laplanders.

2. The conqueſt by the Goths.

3. Norway was divided into twenty, or more, petty monarchies, till the ninth century, being as may be conceived in a more ſavage ſtate than Denmark, and Sweden. From that ſingular and intereſting work, the hiſtory by Snorro, which is chiefly that of Norway, it would appear that the Norwegian monarchs ſprung from the ancient royal family of Sweden. The ſovereignty originally founded in the S. E.

* Jemptland and Herndal, regarded as Norwegian diſtricts, had been yielded to Sweden in 1645. Pontoppidan, and what is ſtill ſtranger Mr. Coxe, have in their maps extended Herndal or Haridal (Buſching i. 607.) acroſs to the ſea, while it is a ſmall province to the S. of Jemptland, on the E. of the Scandinavian Alps. Of this ſtrange miſtake it appears that Homann's map is the ſole ſource; and his maps are indeed notorious for groſs inaccuracy: nor was it in 1660, as the map aſſerts, that Herndal was yielded to Sweden. Conſult the impartial teſtimony of the general map of Sweden by Hermelin, or in his Atlas the particular map of the province of Herjeadalen. The detection of this great error was neceſſary, as Mr. Coxe's Travels are deſervedly in many hands.

† Catteau may be conſulted for ſome curious details concerning this revolution.

part

Historical Epochs.

part of Norway, around the modern city of Chriſtiana, was extended by degrees, and Harald Harfagre about A. D. 910 became maſter of all Norway. During the conteſt many diſcontented princes and nobles left the kingdom; and among other Ganga Hrolf, or Rollo the walker, ſo called becauſe no horſe could ſupport his weight, proceeded to France; where, in the year 912, the province afterwards ſtyled Normandy was ſurrendered to him and his warlike followers. The romantic ſucceſſes of the Normans in England, Italy, and Greece, are delineated by the maſterly hand of Gibbon.

4. The reign of Olaf I, when Norway and Iceland were converted to Chriſtianity. Greenland had been diſcovered A. D. 982, by Eric the red, and his attendants, from Iceland; which iſland was itſelf peopled from Norway 874—880. In this reign of Olaf I, Vinland, or Wineland, a more ſouthern part of N. America, was diſcovered by Biarn, and by Leif, ſon of Eric the red, A D. 1003. The little colony, ſettled in Vinland about 1006, periſhed from inteſtine diviſions. The country was ſo called from ſome wild grapes or berries; and is ſuppoſed to have been on the coaſt of Labrador, or more probably the iſland of Newfoundland. Currants, or ſmall grapes, are indeed found as far north as the Engliſh ſettlement on Hudſon's bay; and the diſtance from the Norwegian ſettlement in Greenland to Newfoundland, might eaſily have been traced by a veſſel running before the wind, as was the caſe. Yet Greenland alone would aſſign to the Norwegians the firſt diſcovery of America.*

5. The remarkable reign of Olaf II, the ſaint, 1014—1030. His ſecond ſon, Harald III, aſpired to the throne of England, and was ſlain in a battle againſt Harold king of England, on the 25th of September, 1066. This memorable conflict, which, by weakening the Engliſh force, led to the Norman conqueſt, has been haſtily deſcribed by our hiſtorians, who have confounded this king, ſurnamed *Hardrad*, with Harald *Harfagre* who reigned a century and a half before.

* It is ſingular enough that while the Welch antiquaries deafen us with the imaginary diſcovery of America by Madoc, A. D. 1170, the Norwegians have been contented with a ſimple unpretending narration of the facts. Mr. Pennant has ironically obſerved that his countrymen ſuppoſe that *pengwin* derived its name from the Welch ſettlers, while that bird has a *black* head.

The

The ſon and ſucceſſor of this king founded Biorgen, or Bergen, in 1069. Historical Epochs.

6. Magnus II, in the year 1098, ſubdued the Orkneys and Hebudes, which had been ſubject to the Normans from about 850; but the earls had refuſed homage to the Norwegian kings.

7. The Hebudes, or Weſtern Iſlands, were ſurrendered to Scotland, A. D. 1266, by Magnus V: but the Orkneys continued to be regarded as ſubject to Norway till the year 1468. Iceland, which had exiſted as an independent republic, about this time became ſubject to Norway.[2] Magnus V firſt inſtituted hereditary dignities; and imprudently excluded the deputies of the people from the national aſſembly.

8. The final union of Norway with Denmark A. D. 1387; ſince which period the events muſt be ſought in the hiſtory of the latter kingdom.

Antiquities. The ancient monuments of Denmark and Norway are chiefly what are called Runic, though it be not clear at what period the uſe of the Runic characters extended ſo far to the north. Circles of upright ſtones are common in all the Daniſh dominions, in Holſtein, Sleſwic, Jutland, the iſles, Norway, and Iceland; in which latter country their origin is perfectly aſcertained, as ſome were erected even in recent times of the Icelandic republic, being called Domhring, or Circles of Judgement. Some alſo appear to have been cemeteries of ſuperior families. Monuments alſo occur of two upright ſtones, with one acroſs; and of the other forms imagined by our antiquaries to be Druidic. Since the converſion of theſe countries to Chriſtianity, in the eleventh century, many churches were erected; among which are thoſe of Bergen and of Drontheim, both built of ſtone in that century. The reſidences of the chiefs appear to have been generally conſtructed of wood; for there are few ancient caſtles to be found in Denmark or Norway. In Iceland there ſtill exiſts a bath, built by Snorro, the famous hiſtorian, in the thirteenth century; but the edifices were there alſo of timber, ſo that no remains can exiſt.

[2] Torf. Hiſt. Nor. iv. 334.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government —Laws.—Population.—Colonies. —Army.—Navy.—Revenue.—Political Importance and Relations.

RELIGION. THE religion of Denmark and Norway is the Lutheran. There is no archbishop; but the bishoprics are twelve, six in Denmark, four in Norway, and two in Iceland. The chief see is that of Zeeland, which yields about 1000l. a year. The others are from 400l. to 600l.: the bishoprics of Skalholt and Holun in Iceland are only valued each at 150l., but living is far cheaper in that island. The other clerical orders are provosts, or archdeacons, parish priests, and chaplains. The parochial clergy are maintained by their glebes, tythes, and surplice fees; but in Jutland some of the livings do not exceed 20l. a year.* The number of curates and vicars is 2,462.†

Ecclesiastic Geography.

Government. Since the revolution of 1660, the Danish government has been an absolute monarchy. That revolution was produced by the obstinacy of the nobility, and consequent enmity of the clergy and burgesses, who perceived no other means of humbling their adversaries. As the northern nations are seldom deficient in good sense, we may conceive that theoretic reasonings on the subject are idle; and that as the nobility would make no concession whatever, there remained only the alternative of an absolute monarchy, or a civil war. At the same time, as the intentions of the clergy and burgesses were perfectly understood, and their original aim was to acquire a parity of power,

* Riesbeck, iii. 101, gives a singular picture of the Danish parochial clergy, who are as much venerated by the people as they were in Scotland a century ago; but are orators of despotism, being held in strict bonds by the court.

† Catteau, iii. 32.

it may well be regarded as extremely ungenerous in the monarchs, that they did not restore the national council, so constituted and balanced. It is indeed not a little remarkable that, since that period, the genius of Denmark has ever yielded to that of Sweden, a proof that an absolute sovereign in fact weakens his own power; for liberty is the parent of industry and exertion, and a free people can supply strength and resources to the throne, infinitely surpassing those of despotism. Government.

The Danish government has however been generally conducted with mildness and moderation; and their regal acts pass through many councils, who carefully observe the legal forms. The laws are chiefly comprized in the code of Christiern V, who reigned in the end of the seventeenth century. This code consists of six books: 1. on judgement and judges: 2. religion and religious orders: [illegible]vil and economical affairs: 4. navigation and maritime laws: 5. property: 6. crimes: forming only a small volume like the laws of Sweden, Russia, and Prussia; while in the south of Europe a life might be consumed in perusing the laws of some of the states. The peasants who had unaccountably sunk into slavery were all declared free in the year 1800.* Laws.

The population of the Danish dominions is computed at two millions and a half; though there seem little room to infer that it yields to that of Sweden. If we suppose the square contents to be about 180,000 miles, there will only be 12 inhabitants to the square mile. Norway is not supposed to contain more than 700,000 souls, nor Iceland above 50,000, the former only yielding six, the latter one, to the square mile. Population.

Denmark possesses some small colonies, as Tranquebar on the coast of Coromandel, Christiansburg on the coast of Guinea, a small part of Greenland in America; with three islands in the West Indies, St. Jan, St. Thomas, and St. Croix, of which the latter was purchased from France in 1733.† Colonies.

* By a great singularity the solemnity of capital punishments, and the singing of psalms, led some fanatics to commit crimes that they might die such a Christian death. Catt. i. 358.

† They yield about 21,000 barrels sugar, 9,000 rum, 300 quintals of cotton, besides coffee and fruits. In 1803 slavery was to cease.

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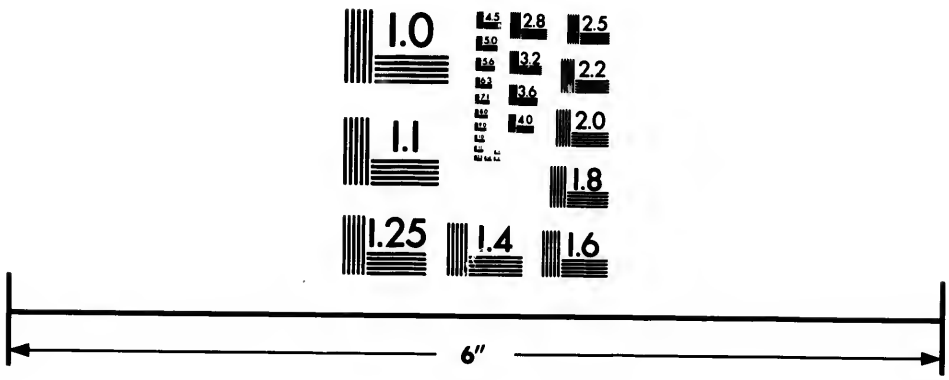

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Army. The army of this kingdom is computed at 70,000 men, of which Denmark ſupplies about 40,000, and Norway the remainder. The

Navy. navy conſiſts of 33 ſhips of the line, manned by about 11,000 ſeamen, and 5000 marines.

Revenue. The annual revenue is computed at about one million and a half ſterling, being ſuperior to that of Sweden. Denmark contributes 543,554l.: Norway 290,000l.: Sleſwic and Holſtein 300,000l.: the Weſt Indian iſlands 262,000l.: the toll levied upon ſhips paſſing the Sound 122,554l.: Altona, 3,150l. The expences of the ſtate amount annually to about 1,050,000l.; and it is burthened with a debt of 2,600,000l.[1]

Political Importance and Relations. Denmark and Norway have long ceaſed to be objects of terror to the ſouthern powers, and centuries have elapſed ſince any of the monarchs has been diſtinguiſhed in war, while the Swedes on the contrary have maintained their martial ſpirit. Chriſtiern IV, whoſe long reign extended from 1588 to 1648, was the laſt of the warlike monarchs; and ſince that period the Danes have been vanquiſhed in every conteſt, either in Sweden or Germany. The reſources of the monarchy have alſo been weakened by its deſpotiſm; and Denmark is little regarded among the European powers. A timid policy has long united her in alliance with Ruſſia, as a mean of ſecurity againſt Sweden; but more wiſdom would appear in a firm alliance with Sweden* and Pruſſia againſt the exorbitant power of the Ruſſian empire. To a nation at war with Pruſſia, Denmark may conſtitute a valuable ally; but difference in religion, and other cauſes, have ſecured this ſtate from the influence of Auſtrian policy. To France it may be conceived that Denmark would now prove a more uſeful and near ally than Sweden, the connexion with which kingdom was grounded on peculiar circumſtances in the ſeventeenth century, before the dawn of Pruſſian greatneſs; and at preſent hardly a caſe could be imagined in which

[1] Boetticher's Tables. Catteau, ii. 84. computes the revenue at 7,270,172 livres.

* It would be wiſe in both the Scandinavian ſovereigns to abandon fabulous and interfering titles; and to content themſelves with the general ſtyle of Sweden and Denmark.

Sweden

Sweden could yield the ſmalleſt aſſiſtance to France. The natural and deep connexions between England and Ruſſia would, on the ſuppoſition of a firm alliance againſt the latter power, of courſe eſtrange the former from Denmark.

POLITICAL IMPORTANCE, &c.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Cuſtoms. — Language. — Literature. — Education. — Univerſities. — Cities and Towns. — Edifices. — Roads. — Inland Navigation. — Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE manners and cuſtoms of the ſuperior Danes differ little from thoſe of the ſame claſſes in other parts of Europe. To the diſgrace of the government the peaſantry continue in a ſtate of vaſſalage; except thoſe of the crown, who have been recently delivered by the patriotiſm of the heir apparent, and a few other inſtances. They are of courſe idle, dirty, and diſpirited; while thoſe of Sweden appear to have been always free; nor would it be eaſy to fix the period when vaſſalage, ſo foreign to the nature of the northern governments, firſt began in Denmark. In addition to this radical cauſe of the want of national energy, property is ill divided; and the middle claſſes, eſpecially that of yeomanry, the glory of England, are almoſt unknown. In Norway, on the contrary, where the baneful effects of the feudal ſyſtem had not penetrated, every peaſant breathes the air of freedom, except thoſe of a few noble eſtates near Frederickſtadt. "The benefits of the Norway code are ſo viſible in its general effects on the happineſs and in the appearance of the peaſants, that a traveller muſt be blind who does not inſtantly perceive the difference between the free peaſants of Norway, and the enſlaved vaſſals of Denmark, though both living under the ſame government."[1] Among the numerous inconſiſtencies of human nature it is indeed one of the moſt ſingular, that abſolute monarchs ſhould be anxious to improve the breed of their horſes, and to debaſe that of their ſubjects. The able writer laſt quoted proceeds to

[1] Coxe, v. 9.

obſerve

obſerve that the Norwegian peaſants are ſpirited, frank, open, and undaunted, yet not inſolent; and, inſtead of the ſervile bow, they ſhake the hand of their ſuperior or benefactor: in the comforts of life they ſeem to yield to none, except ſome of the Swiſs: their uſual dreſs is of a ſtone colour, with red buttonholes, and white metal buttons; and the women often appear only dreſſed in a petticoat and ſhift, with a cloſe collar round their throat, and a black ſaſh. Their uſual bread, like that of the Scotiſh peaſantry, conſiſts of flat cakes of oatmeal; and in times of great ſcarcity is mingled with the white inner rind of trees. MANNERS AND CUSTOMS.

At the furtheſt northern extremity of Norway is the region of Finmark, or more properly Lapmark, being a large province poſſeſſed by the Daniſh Laplanders, and extending even to the eaſt of Cape Nord towards Ruſſian Lapland. The inhabitants of this wild and remote province have been deſcribed at conſiderable length by Leems, who has preſented a complete and faithful picture of Laplandic manners.[2] This ſingular race of men is of ſmall ſize, generally about four feet, with ſhort black hair, narrow dark eyes, large heads, and high cheek-bones, a wide mouth, and thick lips, and of a ſwarthy complexion. In the ſouthern part of Finmark they are mingled with Norwegians; but the northern wilderneſs is wholly their own. They call themſelves *Same*, their ſpeech *Same-giel*, and their country *Same-Edna*, being probably of the ſame race as the Samoieds. The language has only an affinity with the Finniſh, but not nearly ſo much as the Daniſh has with the German;[3] and it would ſeem that they had anciently a different ſpeech, which they enriched with large additions from that of their more poliſhed neighbours the Fins. Towards the ſhore they build huts; and on the mountains uſe tents of a ſingular form, being flatly conic, and divided into two parts by a kind of paſſage, each part having three rude ſubdiviſions, only marked on the floor; the two furtheſt for the maſter, miſtreſs, and gueſts; the middle on each ſide of the fire for the children: while thoſe neareſt the door are aſſigned to the ſervants; behind whom the cattle alſo find refuge, theſe Laplanders.

[2] Leemius de Laponibus Finmarchiæ. Copenhagen 1767, 4to. Scheffer treats of the Swediſh Laplanders: of the Ruſſian there ſeems no ample account.

[3] Leems, p. 11.

being

MANNERS AND CUSTOMS.

being indeed few, while the rein deer form their chief wealth. The ſun is here abſent for ſeven weeks; yet from ten in the forenoon to one in the afternoon there is a kind of twilight even in the ſhorteſt days, ſo that one may read without a candle; but the ſtars are very viſible, and the moon, when apparent, ſhines all the day. In return the ſun never ſets for ſeven weeks of ſummer; but his beams are dull and remiſs in the night, when he aſſumes a ruddy hue. Several rivers, particularly the Tana in eaſtern Finmark, which ſometimes ſwells to a great height with the melted ſnows, ſupply ſalmon, and other fiſh, a conſiderable part of the Laplandic food; but at a feſtival are ſeen mutton, or rein-deer, and mead. The men wear conic red caps, lined with fur, and a kind of robe of cloth or ſkin; the poor ſometimes uſing that of ſalmon, which appears like a white ſhagreen: the head and neck are protected with a ſort of cowl, and the veſt is of undreſt ſheepſkin, the wool inwards. The head-dreſs of the women is narrowed in the middle, whence it widens like a baſon at the top; and the veſt and robe reſemble thoſe of the men. Their amuſements are ſhooting with the bow at a mark, a kind of tennis, and a game reſembling draughts. They are alſo fond of wreſtling, and other exerciſes.[4] They were formerly addicted to magic, and were fabled by incantations to invoke a demon in the ſhape of a fly, which was called the *gan-fly*, and commiſſioned to ſting their enemies. Till recent times they were immerſed in paganiſm, regarding particular mountains and rocks as holy: their chief god was Radien, who dwelled in the ſtarry heaven; in the lower aerial regions were Beivi or the ſun, a god, as Grotius has obſerved, very unjuſt to them; with Horangalis or the thunderer, and other divinities. On earth were the gods of hunting and fiſhing; and the goddeſs Maderakko, with her daughter Sarakka, a kind of Venus, who prepared the body after Radien had ſent the ſoul. The Saivo Olmak, or gods of the mountains, were ſuppoſed to be oracular. For a more full account of this mythology the reader is referred to Leems. The places of ſacrifice were chiefly holy mountains near the firth of Waranger, and along the Tana, and ſome on the bay of Porſanger. Their magical drums and ſongs are already trivial.

[4] Leems, 388.

Amidſt the converſion of the northern nations to Chriſtianity, the Laplanders had been unaccountably neglected. Eric Bredal, biſhop of Drontheim, made ſome vain attempts about the year 1660; but the royal miſſion was not founded till 1714; and extended to the Laplanders of Finmark, with thoſe of Norland to the ſouth, being a conſiderable portion of the dioceſe of Drontheim. Since that period the miſſionaries have exerted themſelves with great ſucceſs; there being commonly two for Finmark, one for the eaſt who preſides over Waranger, Tana, and Laxefiord; the other for the weſt, over Porſanger, Hvalſund, and Alten.[5] Leems well delineates the hardſhips ſuffered by theſe miſſionaries; among which, the cold is ſo exceſſive that, when he was ſitting near a ſtrong fire, the wall behind would preſent his ſhade in thick hoar froſt. MANNERS AND CUSTOMS.

The manners and cuſtoms of the Greenlanders ſhall be conſidered in treating of N. America. Suffice it in the mean time to mention that the curious canoes, only capable of containing a ſingle perſon, and which are ſometimes driven as far as the northern iſles of Scotland, where they are ſaid to belong to Finlanders, are in truth only known in Greenland; whence they are driven by the violence of the weſtern wind: nor is the diſtance greater from the ſouth of Greenland, than from the north of Finmark; where, as appears from Leems, the canoes are of a very different conſtruction.

The people of Iceland being of Norwegian extract, have few peculiar manners, but retain more of the ancient dreſs and cuſtoms of their anceſſors. They are conſtrained to prepare flour from various plants deſcribed by Von Troil; and their chief animal nutriment is dried fiſh; the common beverage is ſyra, or ſour whey kept in caſks and left to ferment, beer being ſcarce.

If we except the Laponic, the languages ſpoken in the Daniſh dominions are all ſiſter dialects of the Gothic. The Icelandic is the moſt ancient and venerable; and being eſteemed the moſt pure dialect of the Gothic, has engaged the attention of many profound ſcholars, who have conſidered it as the parent of the Norwegian, Daniſh, and Swediſh, and in a great degree of the Engliſh, though it would ſeem that this Language.

[5] Leems, 570, &c.

 laſt.

Language. laſt is more connected with the Friſic, and other dialects of the north of Germany. In the ancient Icelandic the Lord's prayer is as follows:

Fader uor ſom eſt i Himlum. Halgad warde thitt nama. Tilkomme thitt Rikie. Skie thin Vilie ſo ſom i Himmalam ſo och po Iordaunè. Wort dachlicha Brodh gif os i dagh. Ogh forlat os uora Skuldar ſo ſom ogh vi forlate them os Skildighe are. Ogh inled os ikkie i Freſtalſam Utan frels os ifra Ondo. Amen.

In the Finniſh it is as follows:

Iſa meidan joca olet taiwaſſa. Pyhitetty olcon ſinum Nimes. Lahes tulcon ſinum Waldacundas. Olcon ſinum tahtos niin maaſca cuin taiwaſa. Anna meile tanapaiwana meidan joca paiwainen leipam. Sa anna meille meidan ſyndim andexi nuncuin mekin andex annam meidan welwottiſtem. Ja ala jahdata meita kiuſauxen. Mutta paaſta meita pahaſta. Amen.

And thus in the Laplandic:

Atki mijam juco lee almenſisne. Ailis ziaddai tu Nam. Zweigubatta tu Ryki. Ziaddus tu Willio naukuchte almeſne nau ei edna mannal. Wadde mijai udni mijan fært pæſwen laibebm. Jah audagaſloite mi jemijan ſuddoid naukuchte mije andagaſloitebt kudi mije welgogas lien. Jah ſiſſalaidi mijabni. Æle tocko kæckzællebma pahaſt. Amen.

It will hence appear that the Laplanders have borrowed ſome terms from the Gothic, as well as from the Finniſh.

Literature. The literature of Denmark cannot aſpire to much antiquity, having followed, as uſual, the introduction of Chriſtianity, which was not eſtabliſhed till the eleventh century. In the next century lived Saxo Grammaticus, whoſe hiſtory of Denmark abounds with fable, but whoſe ſtyle and manner are ſurpriſingly claſſical for that age. His contemporary or predeceſſor, Sveno, is more veracious and conciſe, and is eſteemed the father of Daniſh hiſtory. In general the ancient literature of Denmark is much more opulent than that of Sweden, as the collection of Daniſh hiſtorians may evince. Norway cannot boaſt of a native writer till a recent period; Theodoric the monk of Drontheim, who wrote a ſhort hiſtory of the ancient kings, being ſuppoſed to have been a German. But it is a truly ſingular circum-

ſtance in the hiſtory of European literature, that letters highly flouriſhed in the remote republic of Iceland, from the eleventh to the fourteenth century; and independent of the fabulous Sagas, which might be counted by hundreds, the ſolid and valuable works then produced in that iſland might fill a conſiderable catalogue. From Iceland we derived the Edda, and our knowledge of the ancient Gothic mythology. From Iceland the Swedes, Norwegians, Danes, and Orcadians draw their chief intelligence concerning their ancient hiſtory, Snorro in particular being ſtyled the Herodotus of the north: and the Landnama, or book of the origins of Iceland, is a unique work, diſplaying the names and property of all the original ſettlers, and the circumſtances attending the diſtribution of a barbaric colony. LITERATURE.

After the reſtoration of letters Denmark continued to maintain her wonted aſcendancy over Sweden; and the name of Tycho Brahe is yet celebrated, but his little iſle of Hwen, noted for his aſtronomical obſervations, now belongs to Sweden. This laſt kingdom has for a century been more diſtinguiſhed in literature than Denmark, which has been chiefly occupied in hiſtory and antiquities, while Sweden, without neglecting theſe provinces, has alſo cultivated with great ſucceſs the moſt intereſting branches of natural hiſtory. The names of Arnas Magnæus, Langebek, Schoening, and Suhm, are eminent among the cultivators of national hiſtory; and Holberg was a writer of wit as well as of erudition.* The botany of Denmark has been illuſtrated by Œder; and Niebuhr is diſtinguiſhed as an intelligent traveller: but in the other paths of ſcience and literature there ſeems to be a deplorable deficiency; nor would it be eaſy to ſpecify a Daniſh poet, philoſopher, phyſician, or able and critical hiſtorian.

The ſilence of travellers and geographers concerning the modes of education purſued in different countries has been more than once re- Education.

* From the products of his literary labour he founded portions to marry poor girls. Catt. iii. 17.

For Daniſh authors ſee the remarks of Fabricius, at the end. Catteau iii. 132. mentions Ewald, Veſſil, and Tulin, as the fathers of Daniſh poetry: Buggé in aſtronomy; Loevonorn and Morville in geography; Schlogel in ſtatiſtics. M. Neergaard is an able mineralogiſt.

EDUCATION.

gretted in this work; but the materials are not equally deficient concerning Denmark. While in Sweden there is only a ſchool in each of the large towns, maintained at the expence of the crown; in Denmark each pariſh is provided with two or three ſchools, where children are taught to read and write their native tongue, and the principles of arithmetic: the ſchoolmaſters are allowed about 12l. a year, with a houſe, and ſome other advantages.[6] There are beſides many Latin ſchools, maintained at the royal expence; 16 in Holſtein; 11 in Sleſwic; 19 in Denmark Proper or Jutland and the iſles: but only 4 n the wide extent of Norway; and 2 in Iceland. Theſe have a rector or chief maſter, a conrector, and two or three aſſiſtants; but the ſmalleſt have only one maſter, the ſalaries being from 60l. to 200l. a year. There is alſo a ſpecial ſeminary for the Laplanders at Bergen: and at Soroe, Odenſee, and Altona, there are ſuperior academies of education.

Univerſities.

The univerſities are at Copenhagen, and Kiel. There ought to be another at Bergen. The royal academy of ſciences was founded in 1742, but has been more diſtinguiſhed in national antiquities, than natural hiſtory. In 1746 was founded the ſociety for the improvement of northern hiſtory, alſo ſtyled the royal ſociety of Icelandic literature. There is another reſpectable inſtitution at Drontheim, ſtyled the royal ſociety of ſciences. Theſe foundations confer honour on the Daniſh government; and will doubtleſs contribute to diffuſe ſcience, and inſpire emulation.

Cities and Towns.

Copenhagen.

Copenhagen, the chief city of Denmark, ſtands in a delightful ſituation, on the eaſtern ſhore of the large and fertile iſland of Zeeland, about 25 Britiſh miles to the ſouth of the noted ſound, where the veſſels that viſit the Baltic pay a ſmall tribute to Denmark. It is the beſt built city in the north, for though Peterſburg preſent more ſuperb edifices, yet Copenhagen is more uniform; the houſes being moſtly of brick, but a few of freeſtone from Germany.[7] The ſtreets are rather narrow, but well paved. This city only became the metropolis

[6] Coxe, iv. 57. v. 187. See alſo Catteau, iii. 63. who celebrates the foundations by Pleſs and Reventlow.

[7] Ib. v. 126.

in

in 1443, being formerly an obſcure port, whence it retains the name of Kiobenhaven, or the harbour of the merchants, and it has little claim to antiquity.* The royal palace, which was a magniſicent pile, was conſumed by fire a few years ago: and the city ſuffered dreadfully from the ſame cauſe in 1728. It is regularly fortified, the circumference being between four and five miles, and the inhabitants about 90,000. The harbour is ſpacious and convenient, having on the ſouth the iſle of Amak, peopled by the deſcendants of a colony from Eaſt Friſland, to whom the iſland was granted by Chriſtiern II, to ſupply his queen with vegetables, cheeſe, and butter, a deſtination ſtill retained. The ale-houſes are computed at 1900. The magiſtrates are appointed by the king; but the burgeſſes have deputies to protect their rights. Cities and Towns.

Next in dignity, though not in population, is Bergen the capital of Norway, founded in the year 1070, though ſome aſcribe the foundation to the preceding year. It is ſeated in the centre of a valley, forming a ſemicircle round a ſmall gulph of the ſea. On the land ſide it is defended by mountains; and on the other by ſeveral fortifications. All the churches and many of the houſes are of ſtone. The caſtle and cathedral are remarkable edifices. The chief trade is in fiſh, hides, timber, &c. and Bergen was formerly connected with the Hanſeatic towns. It retained the right of ſtriking money till 1575. This city, being chiefly conſtructed of wood, has been expoſed to repeated conflagrations, among which the moſt dreadful were thoſe of 1248, 1472, 1640, 1702, 1756, and 1771; during which laſt it is ſaid that the flames were viſible in the iſles of Shetland, or at leaſt the red reflexion in the ſky. The population is computed at 19,000.[8] Bergen.

The third city of Denmark, and indeed the ſecond in population, is Altona on the Elbe, within a gun-ſhot of Hamburg, originally a village of the pariſh of Ottenſen; but in 1640 it became ſubject to Denmark, and was conſtituted a city in 1664. In 1713 it was almoſt Altona.

* The moſt ancient capital was Leyre, or Lethra, near Roſkild, which laſt became the metropolis about A. D. 950. Mallet Abr. p. 13. For Roſkild ſee Buſching, i. 182 Coxe, v. 262.

[8] Buſching, i. 369. Catteau ſays 16,000.

Cities and Towns.

entirely reduced to ashes by the Swedes; but its commerce was afterwards so much fostered by the Danish sovereigns, as a diminutive rival of Hamburg, that it is computed to contain 25,000 inhabitants [9].

Christiana.

Christiana,* in the south of Norway, must also be named among the chief towns, though it only contain 10,000 souls. It stands in the midst of a fertile country; and is by some esteemed the capital of Norway, because it contains the chief court of justice, and is unquestionably the most beautiful town in that kingdom. It was founded by Christiern IV, in 1624, after Opslo was consumed by accidental fire. Christiana being situated in the midst of iron and copper mines, and not far from the celebrated silver mines of Kongsberg, the export of metals is considerable; but tar and deals form the chief articles. The deals are mostly sent to England; the red wood being produced from what is called the Scotch fir, and the white from the spruce fir.[10].

Drontheim.

Drontheim, about 270 British miles to the N. of Bergen, was anciently called Nidaros. The inhabitants are only computed at 8000; but as this is the most northern city in Europe except Tornea, the population cannot of course be great. Drontheim is situated on the river Nid, whence it derived its name, and was founded in the year 997, being the residence of the ancient kings of Norway and afterwards an archbishopric, suppressed at the reformation. Of the cathedral, which was built of marble,† the choir also remains. There is some commerce in wood, fish, tallow, and copper from the mines of Medal and Roras. The other towns of Denmark, as Gluckstadt, Elsinore, Flensburg, Kiel, Arhus, &c. have only from 300 to 6000 inhabitants.‡

Edifices.

The chief public edifices are in the cities. The castle and palace of Cronberg, and the two other royal villas in Zeeland, do not merit a particular description, the buildings and gardens being generally in an anti-

[9] Busching, ii. 68. In 1771 Christiansund, on the border of Slesvig, was founded by the Moravians, and is a thriving place.

* *Christiania* is harsh and scarcely pronounciable.

[10] Busching, Coxe. Christiansund, founded by Christian VI, in 1734, contains 3000 souls. Fabricius Voy. en Norwege p. 488.

† By recent accounts, lapis ollaris.

‡ The town of Hammerfest, recently founded on the borders of Finmark, has already become a mart. Cat. ii. 217. Will no examples teach us, that a city on the western coast is the only solid plan of improving the Highlands of Scotland?

quated

quated taste. The roads in Denmark and Norway were till lately much neglected, and formed a striking contrast with those of Sweden, but since 1798 great improvements have been made. Edifices.

The chief inland navigation of Denmark is the canal of Kiel, so called from a considerable town in the north of Holstein. This canal is intended to unite the Baltic with the river Eydar, which flows into the German sea. The extent of this important canal is about 20 British miles and a half; the breadth 100 feet at top and 54 at bottom; the least depth is about 10 feet, so as to admit vessels of about 120 tons.[u] It was begun in July 1777, and was finished in 1785. In 1798 the vessels that passed were 2,250. Jutland being generally a flat country, there is little doubt but great improvements might be effected by draining and canals, on the Dutch plan, were not an absolute government commonly adverse to industry. Inland Navigation.

The manufactures of the Danish dominions are few and unimportant. Coarse woollens, stockings, cottons in imitation of Manchester, linens, refined sugars, are among the chief.* Some have been recently encouraged by the crown, which has paid more attention to commerce and agriculture than to the arts and sciences; though the former deplorable state of the roads, in which all travellers agreed, evinced that the Danes had not just ideas of improvement. The chief exports of Denmark consist of native products. Jutland with the isles, Slesvic, and Holstein, generally export corn to a considerable amount; and the horses and cattle of the latter province furnish a supply to Holland. The cream coloured horses of Oldenburg, a small maritime district in Westphalia formerly belonging to the Danish kings, who thence derive their origin, are of well known majesty and beauty. The chief products of Norway are wood, hides, chiefly those of the goat; with silver, copper, and iron; while Iceland exports dried fish, falcons and hawks, and eider-down. The commerce of this kingdom has been greatly improved since the acquisition of Altona, and the opening of the Manufactures and Commerce.

[u] Coxe, v. 501.

* See Catteau's able statistic work for the details.

Kiel

MANUFACTURES AND COMMERCE.

Kiel navigation. The colonies in the East and West Indies also supply some resources.*

* Mr. Marshall, or rather Sir John Hill, ii. 289, pronounces Denmark to be in a flourishing situation; and justly warns his reader not to trust lord Molesworth, whose book is a mere declamation in favour of the whig aristocracy, which he confounds with liberty.

For a minute account of the state of the commerce the reader is referred to the work of Catteau, which may be regarded as one of the best statistical works which has ever been published. The docks at Copenhagen were considerably improved by Gerner, an able mechanician. The number of Danish seamen is computed at 30,000. The effective ships of the line, in 1801, were only 22, while there were seven old dismasted vessels. In 1795 there were exported from Denmark 6000 horses, 22,000 beeves, 9000 tons of salted meat. Aalborg in Jutland used to export great quantities of salted herrings. The Chinese trade from 1780 to 1793, had yielded more than 3,000,000 rix dollars; and about the same sum was gained by that to India. The exports of timber from Norway, in the year 1799, were 1,169 cargoes, containing more than 60,000 *lasts*, of which about two-thirds passed to the British dominions. In the same year Norway exported 251 cargoes of fish, chiefly to France, Spain, and the Mediterranean: the number of ships above ten *lasts* belonging to Denmark Proper are 683, to Norway 747, and to the two duchies of Slesvig and Holstein 743; in all 2183, conducted by 18,900 mariners.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

THE kingdom of Denmark proper, consisting of those ancient seats of the Danish monarchy, the isles of Zeeland, Funen, Laland, and Falster, with others of inferior size; and the extensive Chersonese or peninsula, which contains Jutland, Slesvic, and Holstein, may be considered as possessing a humid, and rather temperate climate. Yet the winter is occasionally of extreme severity, and the sea is impeded with ice. Norway, chiefly extending along the west side of the Scandinavian Alps, exposed to the vapours from the Atlantic, is not so cold a region as might be conceived. Finmark indeed feels the utmost rigour of winter; while in Iceland, on the contrary, that season is unexpectedly moderate, so as generally to permit the natives to cut turf even in January. CLIMATE AND SEASONS.

The aspect of such wide and detached regions may be conceived to be greatly diversified. The isle of Zeeland, which is about 700 miles in circumference, is a fertile and pleasant country, with fields separated by mud walls, cottages either of brick or white washed, woods of beech and oak vales, and gentle hills.* The same description will apply to Funen, which is about 340 miles in circumference, and which is said to be as well cultivated as most of the counties in England. Holstein and Slesvick are also level countries; and though Jutland present many upland moors, and forests of great extent, especially towards Aalborg or in the centre of the northern part, yet there are fertile Face of the Country.

* Sandhills are sometimes destructive on the coast; the chief protection from their ravages is the *elymus arenaria*. Catteau, i. 84.

Face of the Country.

paſtures; and the country being marſhy and not mountainous, might be greatly improved, eſpecially if the proprietors were to reſide upon their eſtates, inſtead of committing them to the care of ſtewards. Norway is on the contrary perhaps the moſt mountainous country in Europe; but in the ſouth there are tracts of great fertility. Mr. Coxe deſcribes this part as being ſometimes fertile and agreeable; and though often rocky, the ſoil is rich. "The face of the country is prettily ſprinkled with numerous lakes and rivulets, and thickly dotted with cottages, rudely though not unpleaſantly ſituated on rocky eminences, in the midſt of the luxuriant foreſt"[1]. The Norwegian Alps are frequently covered with dark foreſt of pines and fir; and the perpetual ſnow of the peaks is rarely accompanied with the glaciers and other terrors of the Alps.

Soil and Agriculture.

By the abolition of commons agriculture has recently been much advanced. Zeeland chiefly produces barley and oats; Funen buck wheat; while wheat is confined to Laland and Falſter *. In Holſtein, and the ſouth of Jutland, the ſoil is fertile; in Norway, though vegetation be in ſome places ſo quick that the corn is ſown and reaped in ſix or ſeven weeks, yet the portion of arable ground is ſcanty, and far from ſufficient to ſupply the conſumption.† In the autumnal rains, to which Norway is expoſed, the peaſants dry their harveſt in a method which might be found uſeful in the Scotiſh Highlands, by erecting poles croſſed by others, on which the ſheaves are ſiled.[2] That mountainous country is however abundant in paſture and cattle; which, as in Swiſſerland, are driven to the heights in ſummer; and a patriotic ſociety has ſo much encouraged agriculture, that within theſe fifty years eſtates have riſen nearly one third in value.[3] In the extenſive iſland of Iceland, there is not much room for agriculture; which has

[1] v. 31. * Catt. ii. 132.

† See ſome remarks by Fabricius at the end. This intelligent author obſerves, that potatoes do not thrive in Norway, becauſe the ſummer is ſo ſhort. Voy. en Norw. p. xxvii. But that excellent root begins to be common in Denmark. Catt. ii. 136. The *Feſtuca fluitans* yields a fine flour, while the plant feeds horſes. Catt. ii. 138. As this plant thrives in marſhes, it might be highly valuable in our agriculture.

[2] See the plate in Pontoppidan's Norway. In Ruſſia a kind of oven is uſed.

[3] Coxe, v. 18.

however

however greatly declined ſince the period of the republic, when treatiſes were written on this intereſting ſubject. Soil and Agriculture.

In 1789, the rivers in Norway ſuddenly roſe to a great height, to the laſting injury of the agriculture.*

In the kingdom of Denmark proper the rivulets are numerous; but ſcarcely a river of any note except the Eydar, the ancient boundary between Denmark and Germany. Towards the north of Jutland an extenſive creek of the ſea, called Lymfiord, penetrates from the Cattegat to within two or three miles of the German ſea, navigable, full of fiſh, and containing many iſlands.[4] This remarkable inlet, which is as it were a Mediterranean ſea in miniature, might well be expected to enrich the neighbouring country, but ſeems to be neglected, as travellers and geographers are ſilent. There are ſeveral other creeks which are by the Danes ſtyled Fiörds, or Firths, but ſcarcely another river worth mentioning; for the Guden, which becomes navigable at Randers, though celebrated for its ſalmon, is of a very confined courſe. Rivers. Lymfiord.

In Norway, as in Sweden, the largeſt rivers are called Elven or Elben. Thoſe that riſe in the Alpine chain, and run towards the weſt, have in conſequence but a ſhort courſe; and the chief ports, as in the weſt of Scotland, are ſupplied by creeks, or inlets of the ſea; the great depth of the water and height of the ſhore rendering this coaſt not a little unſafe to navigators. The chief river of Norway is the Glom or Glomen, which is not navigable, but full of cataracts and ſhoals; that near its mouth being about ſixty feet; yet about 50,000 trees are annually floated upon it to Frederickſtadt. Before it receives the Worm from the lake Mioſs, it is as broad as the Thames at Putney;[5] and its rugged courſe muſt render it a tremendous torrent. The Glomen, alſo called the Stor Elv, or great river, ſprings from the lake of Oreſund on the north of the Fœmund, and runs nearly ſouth about 300 Britiſh miles.† Glomen.

Next

* Catt. i. 115.

[4] Buſching, i. 228. Catteau, i. 89, who ſays, that the mouth gradually gets ſhallow: but the towns on the Lymfiord are ſtill regarded as ſea-ports. Herring and eels abound. Id. ii. 154.

[5] Coxe, v. 62.

† In the map by Homann, corrected by Hubner, and prefixed to Pontoppidan's natural hiſtory of Norway, the ſource is very different; and that author joins in the error, p. 91. When it

Rivers. Dramme.

Next may be named the Dramme, which flows into the weſt ſide of the bay of Chriſtiana, having received the Beina, and other conſiderable ſtreams. Leſs remarkable rivers in the ſouth of Norway are the Louven, the Torriſdals which runs by Chriſtian Sand, and others flowing from numerous lakes. In Finmark the moſt conſiderable river is the Tana, which is followed by the Alten; both riſing in the mountains to the north of Swediſh Lapland, and flowing into the Arctic ocean.

Lakes. Mioſs.

The lakes in the Daniſh dominions are numerous, the moſt extenſive being in the ſouth of Norway. The lake of Mioſs is about 60 Britiſh miles in length, but the breadth is in general little conſiderable, except towards the centre, where it is from 12 to 18 miles: it contains an iſland about ten miles in circumference, fertile in corn, paſture, and wood.[6]

Rands. Tyri.

Next is the lake of Rands or Rands-Sion, which is near fifty miles in length, but not more than two in breadth. The lake of Tyri is a beautiful piece of water, about fifteen miles in length and breadth, diverſified with many bays and creeks: the environs are delightful, conſiſting of corn fields, fertile meadows, and hanging foreſts, backed by lofty mountains towering above each other.[7] Other lakes in the ſouth of Norway are thoſe of Ojeren, Or, Kroren, Tonhof, Tind, Huide, Niſſer, Kiel, and Syredal. Further to the north is the large lake of Fæmund, about 35 Britiſh miles in length, by eight at its greateſt breadth: this lake is celebrated by Bergman as being ſurrounded by mountains of great height. Yet further, in a northern direction, are found the lake of Sælbo, through which the Nid paſſes to Drontheim; and the lakes of Beitſtadt and Snaaſen. In Norland is that of Rys: and eaſtern Finmark preſents that of Paſvig.

Fæmund.

Mountains. Norwegian Chain.

In the kingdom of Denmark proper there are no heights, which can aſpire to the name of mountains; but Norway is almoſt wholly an Alpine country. The grand chain, which divides that kingdom from

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it is conſidered that the book and the map were publiſhed in 1751, when Linnæus in the adjacent kingdom was diffuſing the light of natural ſcience, the errors of both are truly ſurpriſing. Perhaps the firſt tolerable maps of Norway, known in England, were that given by Mr. Coxe, and that contained in Arrowſmith's map of Europe. But even recent maps have not always been improved by theſe examples.

[6] Coxe, v. 59. [7] Ib. 53.

Sweden,

Sweden, is known by diſtinct appellations as it paſſes through different provinces. The mountains of Joglefeld may be regarded as its ſouthern extremity, which does not here extend to that point of Norway called Cape Lindes, the Naze of ſeamen, but branches off towards the eaſt. Proceeding northwards Joglefeld is ſucceeded by Buglefeld, and Heklefeld. Hardanger Feld forms a more extenſive denomination, and detaches a branch towards the S. W. Under the parallel of 61° the chain aſſumes the name of Filifeld, followed by Sognefeld, and Langfeld, which terminates a little beyond the 62° of north latitude. The chain now aſſumes a winding direction from weſt to eaſt, and this part, which is eſteemed one of the higheſt, is ſtyled Dofrafeld. Again turning to the N. E. we arrive at the parts towards the parallel of Drontheim, which are generally reckoned the moſt elevated, for towards Lapland the mountains decline in height. The ſucceſſive names of this central portion are Rudfeld, Skarsfeld, and Sulafeld.* Jomafeld and Borrafeld, and ſome other local appellations, are continued by the general name of the mountains of Kolen, which paſs along the eaſt and ſouth of Daniſh Lapland. MOUNTAINS.

In a more general point of view, the ſouthern part of the Scandinavian chain, running nearly N. and S. and terminating at the province of Romſdal, is called LANGFIALL, or the Long Mountains. Hence the part called DOFRAFIALL extends towards the eaſt, ending above the lake of Aurſund or Oreſund; where it again proceeds almoſt due north. Here alſo a conſiderable branch proceeds by Swucku, &c. towards Sweden.† The third part of the range, from the north of

* The fabulous Pontoppidan calls this central chain (p. 41.) Sevebierg, or the ſeven mountains; and in his map the eaſtern parts towards Sweden are called Daarfeld. The name of Sevebierg, or the ſeven mountains, is palpably local, and has no reference to the general chain; though ſome writers affect to regard it as the ſame with Pliny's Sevo, which was in Germany. This term is on the contrary not only local, but recent, and perhaps only applies to the hills called the Seven Siſters, p. 46. It is unknown to former writers; and he confeſſes, p. 41. that the only general name is LANGFELD, or the Long Mountains. See Schoning's map of Norway in the middle ages.

† It is to this laſt only that Pontoppidan gives the name of Sevebierg. It appears that the mountains of Dofra or Dofrine chain, which croſſes Norway from S. W. to N. E. in the centre between the Lang Fiell and mountains of Kolen, forms a line of demarcation, the part to the north having generally winds and weather the very reverſe of that in the ſouth. See Volney's view of the climate and ſoil of the United States of America, Appendix.

Oreſund

Mountains. Oresund and the vicinity of the copper mines of Roras, is called the chain of Kolen, extending between Norway and Swedish Lapland, and afterwards bending, in the form of a horse shoe, on the south of Finmark.[8]

Height. The height of these mountains was as usual extremely exaggerated, and compared with the Swiss Alps, till more exactness was introduced into Orology. Mr. Pennant[9] affords the most recent information on the subject. "Mr. Ascanius, professor of mineralogy at Drontheim, assures me that, from some late surveys, the highest in that diocese are not more than six hundred fathoms above the surface of the sea; that the mountains fall to the western side from the distance of eight or ten Norwegian miles;* but to the eastern from that of forty. The highest is Dovre-fiæl in Drontheim, and Tille in Bergen. They rise slowly, and do not strict the eye like Romsdal-horn, and Hornalen, which soar majestically from the sea. Professor Ritzius of Lund acquaints me that Kinnekulle, in Westro-Gothia, is only 815 English feet above the lake Wenern, or 931 above the sea. He adds that the following have been only measured to their bases, or to the next adjacent waters: Areskutan, a solitary mountain of Jæmtland, about four or five Swedish miles from the highest Alps, which separate Norway and Sweden, is said to be 6162 English feet above the nearest rivers; Swuckustoet within the borders of Norway, 4658 above lake Famund, and that lake is thought to be 2 or 3000 above the sea; and finally Sylfiællen, on the borders of Jæmtland, is 3132 feet perpendicular from the height to the base. By some late experiments the highest mountains of Sweden, between lat. 63 and 64[d], have been found to be 6652 feet above the surface of the Baltic;† but no trees will grow on them at little more than half that height."‡

Areskutan.

Swuckustoet.

Sylfiællen.

The

[8] Busching, i. 378. [9] Arctic Zoology, i. cviii. * Of 18,000 feet each.

† "Mr. Tornsten in Act. Reg. Ac. Holm."

‡ There would seem to be some mistake on the other side; and it is often to be regretted that Mr. Pennant's accuracy is not equal to his industry. Bergman computes the height of Swukku at more than 9000 feet above the sea; and says that it yields in height to the Norwegian Alps, which are here estimated by Ascanius, or mistaken by Pennant, at only 3600 feet above the sea! It is probable that for 600 we should read 1600 fathoms, which would yield 9,600 feet. Upon the whole it would appear that the Scandinavian chain is inferior in height to the Pyrenees, or even to the Carpathian.

Busching,

The conſtruction of the Norwegian mountains has been little explored, nor is it underſtood whether the chief heights be calcareous like thoſe of the Pyrenees, or granitic as is rather to be conceived. Some conſiderable mountains conſiſt of ſandſtone; but we are equally ignorant whether this be the ſiliceous, the agillaceous, or the calcareous ſandſtone. Norway abounds in beautiful marbles of various kinds, whence it appears that a conſiderable part is calcareous; and Pontoppidan has engraved a precipice full of large ſhells. The lapis ollaris, which Pontoppidan calls keegſteen, is found in great quantities, and with it were built the cathedral of Drontheim, and other edifices.[10] This is generally found in the vicinity of granite; which laſt ſeems to be the pebble ſtone of that ignorant author. Aſbeſtos and amianthus alſo indicate granite; and rock cryſtals are found of great ſize and beauty, with talc, garnets, and amethyſts. Chalk and flints are unknown. Further illuſtrations will ariſe in ſpeaking of the mineralogy.* Mountains. Conſtruction.

There are ſome woods in the Daniſh iſles, and foreſts in Jutland. The Norwegian mountains are generally clothed with pines and firs; and almoſt the whole country may be regarded as a foreſt, which ſupplies Europe with maſts, and other large timber. The mountains of Scotland Foreſts.

Buſching, i. 331, ſays that the mountains Tind and Goule, in the S. of Norway, are the higheſt; but in this he errs in copying Pontoppidan, who ſays they are the higheſt in that quarter. The higheſt ſharp ſummits are, in Norway, as in Swiſſerland, called Horns, as Hornalen in Nordfiord, Sneehorn and Skopſhorn in Sundmoer, Romſdal-horn, and others. Many loſty mountains branch out on the weſt towards the ſea.

Of the high mountain Wigeln, and the lake of Oreſund, there is a view in Hermelin's Atlas. There are alſo views of ſome Swediſh and Laponic mountains, as Ruten near the lake Malmagen; of the high ridge between Herdal and Norway, which is patched with perpetual ſnow; and ſome in Lulea Lapmark. If there be any glaciers in Norway or Lapland they have eſcaped Scandinavian reſearch, and the aſpect of the mountains rather reſembles thoſe of Scotland than of Swiſſerland. Catteau, i. 108, ſays Swukku is 2268 Daniſh ells (each two feet) above lake Fæmund. Mount Jiſbre in the N. of the government of Bergen, has perpetual and increaſing glaciers, as has Foglefonden in the S. of the ſame government. Ib.

[10] Pontoppidan, i. 166. ii. 276.

* Bergman, p. 63, obſerves that many of the mountains of Norway are of pudding-ſtone, ſometimes of quartz pebbles, united by grey micaceous cement (the ſame ſubſtance occurs in the Orkneys). Some are of hornblende ſlate in which garnets appear. Ib. 74.

Mountains. were once equally covered, though now denuded, nature ſowing trees exceedingly thick, while man plants them ſo thin that the plantation periſhes for want of mutual protection. Norway may in this reſpect recall a juſt image of Britain as it appeared to the Romans.

Botany. The botany of Denmark proper does not materially differ from that of the other northern provinces of the German empire, which has already been ſlightly ſketched in the account of Pruſſia, and will be hereafter noticed more minutely when deſcribing the other ſtates of the Germanic body. The botany of Norway will be incorporated with that of the reſt of Scandinavia under the article Sweden. All that is neceſſary therefore in this place is to mention thoſe plants natives of Denmark, which are either not at all or but ſparingly found on the other ſide of the Baltic.*

Denmark, together with its German dependencies, is for the moſt part a flat country, and a large proportion of its ſurface is taken up with marſhes and lakes: here and there occur ridges of low rocks, but no mountains even of the third magnitude are to be met with: the remainder of the territory is devoted to cultivation and paſturage, of which the moſt celebrated grazing tracts are included in the duchy of Holſtein.

The ſea ſhore affords the beautiful pulmonaria maritima *ſea lungwort;* and Daniſh *ſcurvy-graſs.* The dry open hills produce anemone pulſatilla, *paſque flower;* dianthus ſuperbus, *fringed pink;* delphinium conſolida, *larkſpur;* and aſtragalus Danicus. The woods and thickets yield *red dog-wood;* pulmonaria officinalis and anguſtifolia, *common* and *narrow-leaved lungwort;* impatiens noli-me-tangere; and the rare ſerapias rubra, *red helleborine.* The marſh ditches abound with ſtratiotes aloides, *water ſoldier;* and the meadows and hedge-ſides furniſh ornithogalum luteum and nutans, *yellow* and *nodding ſtar of Bethlehem;* ranunculus lanuginoſus, *woolly crowfoot;* and oenothera biennis, *evening primroſe.*

Zoology. The Daniſh dominions being of ſuch great extent, and variety of climate and aſpect, there is a great diverſity in the animal productions.

* Flora Danica—Kerſtens, Flora Holſaticæ primitiæ.

The horſes of Norway and Iceland are as remarkable for diminutive ſize, as thoſe of Holſtein and Oldenburg * are for the contrary quality. The beeves are alſo excellent and very numerous in Holſtein and Sleſwig. Among the more peculiar animals may be firſt named the rein deer, common in Finmark and throughout Lapland. This animal reſembles a ſtag, but is ſtronger; and the deep diviſion of his hoofs is adapted to tread on the ſnow, being ſuited by Providence to a cold climate, as the camel is to the hot deſert. The antlers of the rein deer are longer and more branched than thoſe of the ſtag, and they alſo decorate the brows of the female. Theſe animals are ſtill numerous in a wild ſtate, though the Laplanders have reclaimed great numbers, which ſupply the place of horſes and cattle. The elk is a more ſouthern animal, and ſometimes appears in Norway, which is infeſted by the bear, the wolf, and the lynx. The glutton is alſo rather a peculiar animal; and the beaver conſtructs his manſion in Norway with the ſame ſkill as in N. America. The lemming, or Norwegian mouſe, proceeds from the ridge of Kolen, and ſometimes ſpreads deſolation, like the locuſt. Theſe animals appear in vaſt numbers, proceeding from the mountains towards the ſea, and devouring every product of the ſoil: it would ſeem that after conſuming every thing eatable in their courſe, they at laſt devour each other. This ſingular creature is of a reddiſh colour, and about five inches in length. Norway alſo boaſts of ſome peculiar birds, as the picus tridactylus, and the tetrao lagopus. The ſnake called aſpis is alſo found there. In Daniſh Lapland the ſquirrel, which is red in the ſummer, in the winter becomes grey." The author laſt quoted maintains the fable of the kraken; and his deſcription, derived from the natives of Norland and Finmark, correſponds with that of Pontoppidan. The ſalmon ſupplies a conſiderable part of the Laplander's food; and vaſt numbers are tranſported on rein deer from the ſhores of the Tana. Hares are alſo common in that remote region: and the bear, lynx, and fox, are leſs welcome viſitants; nor are the glutton and the beaver

Zoology. Rein deer. Lemming. Finmark.

* Oldenburgh has been recently aſſigned to the younger branch of the houſe of Holſtein Gottorp. Bruns, Geog. &c. Rieſbeck, iii. 121. ſays that the detached principality contains 75,000 ſouls; the revenue 40,000l.

" Leems, p. 219.

Zoology. there unknown. About Roras in Norway the latter animal is sometimes found white.*

Mineralogy. The mineralogy of the Danish dominions is chiefly restricted to Norway, for in Jutland and the isles no important discoveries have arisen, though it be probable that iron, and perhaps coal, may be found. Jutland supplies tripoly and fullers' earth, with some alum, and vitriol. The isle of Moen has hills of chalk; and porcelain clay is found in Bornholm. These regions seem chiefly calcareous, yet freestone is rare. Norway on the contrary abounds in various metals. About the year 1645 some gold ore was found near Arindal, of which ducats were struck. The gold mine of Edswold, about thirty B. miles N. of Christiana, was discovered in 1758, but has been little productive.† In gold Norway yields greatly to the Swedish mines of Adelfors, and only claims the superiority in silver, the mines of Kongsberg, about 40 British miles to the S. W. of Christiana, having been long reputed the richest in Europe; and one mass of native silver in the royal cabinet weighs 409 marks, being worth 3000 rix-dollars or 600l.[11] These mines are minutely described by Bergman, who informs us that the rock consists of vertical banks of micaceous schistus, with garnets, limestone, and quartz. The richest veins are in those of a greyish quartz mingled with small black mica, and reddish petrosilex; but especially in a fine-grained white quartz, and a little calcareous earth, or where the quartz and mica are in alternate strata; the thickness of these banks or layers varying from an inch to three fathoms; and some of them are impregnated with iron. They are passed transversely by the veins of metal, from half an inch to more than two feet in thickness, sometimes accompanied with large grained limestone, but more often with spar; and sometimes with quartz, fluors, white, blue or violet

Silver.

* The large beds of oysters, sometimes half a mile wide, and extending four ells under water, on the western coast of Slesvig, are said to have been laid by the orders of Canute the Great. Catt. ii. 172. Thirty English vessels, constructed for the purpose, make annually three voyages to Norway, each cargo being 16,000 lobsters. Ib. 212.

† Jars observes, vol. ii. that the gold of Edswold, eight Danish miles from Christiana, is in a vein of quartz and pyrites. The mine of Kongsberg, ib. 94, was disclosed by the threads of native silver on the rock; and he says that most of the mines now worked were discovered by the same means. The gangarts are calcareous spar, fluor, and mountain cork; and the native silver is also found in a grey rock (hornblend), which may be regarded as the top and bottom of the mine.

[11] Coxe, v. 45.

selenite,

selenite, and fossil cork, and sometimes with pyrites, yellow copper ore, and blende." The ferruginous layers are the most productive. These mines were discovered in 1623 by two peasants, who were diverting themselves with throwing stones; and in consequence the town of Kongsberg was founded. They are worked by 36 shafts, and used to yield about 70,000l. annually, when 4000 men were employed; but recently 2400 have removed to the cobalt mines at Fossum, 20 miles to the north, and it is supposed that the produce barely defrays the expence. Yet they supply the mint with currency, the largest coin being of eight Danish skillings, or fourpence sterling; and it is esteemed a peculiarity of this mine, that it may be little productive during a year or two, when suddenly a rich vein is discovered which amply repays the loss of labour."[14] Kongsberg is a flourishing town of 6000 inhabitants, situated amidst hills and rocks, which branch off from the great Alpine chain, being about 80 British miles S. E. of the Langfeld: the river Louven runs through the town, in a series of small picturesque cataracts. Mineralogy.

Norway also possesses other silver mines at Iarlsberg in the same region, about 30 miles to the N. E., discovered in 1726, but of small account.

The important copper mines of Roras, about 68 British miles S. E. of Drontheim, were discovered in 1644. They are in the southern slope of the chain of Dofra, in a rock of what the Germans call hornschiffer, or hornblend slate, yet Bergman mentions quartz and mica as ingredients; and he adds that the gangart is *hornberg*, a kind of micaceous schistus, "of so fine a grain that neither the quartz nor the mica can be distinguished in its texture."* The veins are from six inches to six Copper.

[14] Journal des Mines, No. xvi. p. 50. The Baron de Born, in his *Lithophylacium, vel Index Fossilium*, Pragæ, 1775, 2 vols. 8vo. observes, vol. ii. p. 98. that the silver mountain of Kongsberg consists of black clay, intimately mixed with micaceous particles; but it is now known to consist of hornblend and hornblend slate, which often accompany the metals, and have the appearance mentioned by M. de Born. According to the same author, p. 146, the silver mountains on the north and south of Kongsberg are formed of *murkstein*, a mixture of quartz, white mica, and garnets. The same substance is found in the west of Scotland, and may probably indicate the precious metals.

[14] Pontop. i. 183, &c. Coxe, ut supra.

* Such indications are mentioned, as they may lead to discoveries in other countries; but Bergman's account is far from the accuracy of modern mineralogy, and his descriptions seem neither

Mineralogy. ſix ells in thickneſs; and the ore of a pale yellow. The mine of Storward is in a high mountain; the rock being grey gneiſs, which is followed by a blackiſh ſteatite. In general the mines of Roras are very productive, and a ſource of conſiderable revenue. Other copper mines are at Quickne and Selboe, about 50 miles to the eaſt of Drontheim, and at other places, as Meldal and Foledal.

Cobalt. The mines of Cobalt at Foſſum, a recent diſcovery, muſt not be paſſed in ſilence. This metal yields ſmalt, or powder blue, uſed in painting pottery and porcelain, and in colouring ſtarch; and the mine is ſuppoſed to produce a clear annual revenue to the crown of about 15,000l. Near it is a rich vein of quartz, containing large maſſes of talc.[u]

Iron. But the iron mines of Norway are eſteemed the moſt profitable. They are chiefly ſituated not far from Arindal, in the ſouthern province of Chriſtianſand; and near Skeen, between Arindal and Kongſberg.* Lead appears in the vicinity of Kongſberg; and there are alum works near Chriſtiana. Norway produces abundance of marble, with ſome alabaſter, and lapis ollaris. Rock cryſtals occur of a large ſize, often brown or yellow like thoſe of Bohemia and Piedmont, the Cairngorm ſtones of Scotland. In Iceland are found many volcanic productions, particularly black obſidian. The iſles of Ferroe produce agate, jaſper, and beautiful zeolites. Jade and magnets are alſo found in Norway; with curious garnets, eſpecially the green, which are little known in other regions.†

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ther to refer to hornblend nor petroſilex. From Raſpe's Ferber, 327, it appears that petroſilex was conceived to be quartz and mica intimately blended, ſo as not to be diſtinguiſhed by the eye. It is equally difficult to explain Buſching's meaning, i. 340, when he ſays the chief copper mines are at Werdenfiels. Roras is in Guledal.

[u] Coxe, v. 49. There is a mine of plumbago at Englidal. Catt. ii. 232.

* According to Buſching, i. 341, ochre is found near Wardhus, in Finmark, of a beautiful ſky blue, probably like that of Elba, and the ſign of a rich iron mine.

† From the journey of the celebrated entomologiſt, Fabricius, into Norway in 1778 (Paris 1802, 8vo.), we learn that the iron ore of Arindal is black, mingled with quartz, that the gold mine of Edſwold is in a mountain of quartz and mica, the gangart being ferruginous quartz. It is near Raholt not far from Chriſtiana, on the route to the lake Mios. The copper mine of Roras conſiſts of pyrites in quartz and argillaceous ſchiſtus. It was diſcovered in 1644 by a Laplander, who was hunting rein deer; and the mountain chiefly conſiſts of micaceous ſchiſtus with ſchorl and garnets. M. Fabricius juſtly obſerves that all the mines greatly enrich the country.

In mineral waters the Danish dominions are very deficient; and those discovered in 1768 at Oersten in the Sondmoer appear to be little frequented. Mineral Waters.

While the southern parts of the Danish dominions present few natural curiosities, the northern provinces afford many singular features. The Moskoestrom, or Malstrom, is a remarkable whirlpool off the shore of Norland, which will involve boats, and even ships; nay the bellowing struggles of the whale have not always redeemed him from the danger: the bottom is full of craggy spires, and the noise truly tremendous. On the south of the Ferroe isles, there is another dreadful whirpool. The volcanoes of Iceland may also be classed among the grandest features of nature. Among these Mount Hekla is the most remarkable, being situated in the southern part of the island, about 20 British miles from the sea, above which it rises to the height of about 5000 feet. The summit is covered with snow, except some spots where the heat predominates. The craters are numerous, but the eruptions rare; there having only been ten from the year 1104 to 1693, after which it remained quiet till 1766, when it emitted flames and lava. The mountains of Krabla near Myvatn in the N. W., and of Kattlegia, were more known than Hekla by their eruptions in the eighteenth century. The boiling springs of Iceland present a singular phenomenon: that of Geyser to the north of Skallholdt is the most remarkable, rising from an aperture 19 feet in diameter, and springing at intervals to the height of 50 or even 90 feet.[16] Of smaller consequence are several picturesque scenes in Norway, as the hills called the Seven Sisters in Helgoland in the parallel of Tornea. In the same district is the rock of Torghatten, with a perforation of great length and diameter, through which the sun may at times be seen. At Dolsteen, near Herroe in Sundmoer, is a cavern of great length; and at Limur, not far from Ourskoeg, is another cavern above a stream, which seems formerly to have flowed through this superior channel. About 20 miles to the north of Bergen, the rocks abound with singular petrifactions. The mountains are sometimes split and engulphed by subterranean waters, of which Pontoppidan relates some instances, more to be credited as a

Natural Curiosities.

The Malstrom.

Mount Hekla.

[16] Von Troil, 260.

similar

NATURAL CURIOSITIES.

ſimilar event recently happened in the ſouth of France. The farm of Borre, in the province of Chriſtiana, was in 1703 ſwallowed up with all its buildings, and there now remains only a chaſm full of ruins and ſand."[7]

DANISH ISLANDS.

THE prime ſeat of the Daniſh monarchy having ever been in the iſles of Zeeland, Funen, Laland, Falſter, and the others of that group, they have been conſidered in the general deſcription of the monarchy. In the eaſt the furtheſt iſle belonging to Denmark is that of Bornholm, a ſmall but fertile ſpot conquered by the Swedes in 1645, and ſurrendered to them by the treaty of Roſkild, 1658; but the inhabitants revolted the ſame year, and reſtored their iſle to the Daniſh domination, under which it has ſince continued.

Off the weſtern coaſt of Jutland are the iſles of Nordſtrand, Fora, Sylt, Rom, Fanoe, and others, which with Helgeland were known to the Romans; and the writers of that nation appear often to have confounded them with ſome of the Orkneys, and even with the iſlands in the Baltic.*

The Norwegian coaſt preſents one continued ſeries of ſmall and unimportant iſlands, moſt of them indeed uninhabited. Among a few worthy of mention may be named Karm, Bommel, Sartar, Hitteren, and others at the entrance of the gulph of Drontheim: the Vikten or Viktor iſlands are followed by thoſe of Loffoden, the moſt numerous

[7] Buſching, i. 360.

* Theſe iſles have ſuffered greatly by the fury of the ocean. Nordſtrand, after repeated attacks in the years 1350, 1354, &c. was at length almoſt totally ſwallowed up in 1634. Such an inundation aroſe on the 11th of October, at ten o'clock in the evening, that there periſhed 6408 perſons with 50,000 cattle; 1332 houſes, 30 windmills, and 6 churches were ſwept away by the waves. There remained but a high part of the iſle now called Pelworm. Helgeland, which has been ſubject to the Danes ſince the year 1714, has alſo been diminiſhed by repeated aſſaults of the ocean. Buſching, i. 293, 294.

and

and extenſive, and noted for the whirlpool of Malſtrom. Among the dreary iſles on the Laponic ſhore may be named Soroe and Mageroe, that of Wardhus, where there is a garriſon in the Arctic ocean; and the iſle or peninſula of Fiſkeroe, part of which belongs to Ruſſian Lapland. Iſles.

The iſles of Vikten or Viktor produce oats and barley; and it was from them that the powerful Rollo ſailed to France. Thoſe of Loffoden have excellent fiſheries, and the paſturage ſuffices for numbers of ſheep. The iſle of Karm is chiefly remarkable for the high mountain of Augvald. The Norwegian iſles are in general mountainous or craggy, like the correſponding coaſt, with precipitous rocks, and a ſea from 100 to 300 fathoms deep waſhing their baſes. Between them are numerous narrow creeks, overſhaded by vaſt heights like thoſe of the ſhore, and guarded as it were by innumerable ſmaller iſles, and deſart rocks, haunted by ſcreaming ſea-fowl.

For many years the Norwegians held the iſles of Orkney and Shetland, which laſt was ſtyled by them the Land of Hialt, from an adventurer ſo called, whence the corrupt names of Zetland, Yetland, and Shetland. The Ferroe iſles remain an appanage of the Daniſh crown: they are ſeventeen in number, and not unfertile, producing ſome barley, and abundant paſturage for ſheep. Small junipers, ſtinted willows, and birches, alone bear a diminutive image of trees. They were diſcovered prior to Iceland, in the ninth century; and export feathers, eiderdown, caps, ſtockings, and even ſalted mutton, and tallow. Beautiful calcedonies and zeolites are found in the Ferroe iſles; but there ſeems no poſitive reaſon to believe that they were volcanic. The inhabitants do not exceed 5000l.* Ferroe Iſles.

The large and celebrated iſland of Iceland may be regarded as 260 Britiſh miles in length from the moſt weſtern cape to the moſt eaſtern, and about 200 in breadth from N. to S., but the inhabitants do not exceed 50,000. The government was an ariſtocratic republic for about 387 years, till in 1261 it ſubmitted to Norway. The maps of this country are far from being perfect; and the like complaint might juſtly be extended to the Daniſh dominions in general; but as far as Iceland.

* The Ferroe iſles are defended ſince the American war by the citadel of Thorſhaven on the chief iſle Stromoe. Catt. ii. 54. There is a conſiderable mine of coal under baſalt.

ISLES.

can be judged the chief range of mountains runs, like the Carpathian, from the S. E. to the N. W., with ſome branches diverging N. E. This iſland forming ſo extenſive a portion of the Daniſh dominions, ſeveral circumſtances concerning it have been given in the general narration. While it abounds in ſulphur and ſubterranean fires, and volcanoes appear in every quarter, it would be too bold a theory to ſuppoſe that ſo wide an expanſe was ejected from the ſea, not to mention that the ſurturband, or carbonated wood, found at a great depth, evinces a moſt remote vegetation. The higheſt mountains clothed with perpetual ſnow are ſtyled Yokuls; and of theſe Snæfial, hanging over the ſea in the S. W. part of the iſland, is eſteemed the higheſt, being computed at 6860 feet.[1] The mountains are ſaid to be chiefly ſand-ſtone, pudding-ſtone with petroſilex, ſteatite, and argillaceous ſchiſtus. The chief rivers of Iceland are in the eaſt; the Skalfanda, the Oxarfird, and the Brua, all flowing from the S. to the N. Some are white with lime, others ſmell of ſulphur. The calcareous ſpar of Iceland is celebrated for its double refraction ſince the days of Newton: calcedony, zeolite, lava, pumice, and malachite, or copper ſtalactites, are among the mineral productions. In the middle of the fourteenth century this iſle was greatly depopulated by a peſtilence called the Black Death.* A volcanic iſland recently aroſe to the ſouth of Iceland, but afterwards diſappeared. From Iceland a colony paſſed to Greenland, a ſhort courſe of about 200 miles; but the Daniſh colony in Greenland has been long explored in vain, the eaſtern coaſt on which it was ſettled being ſince blocked up by the ice. This barbaric colony was little aware that its ſettlements belonged to another quarter of the globe, Greenland being now univerſally conſidered as a vaſt peninſula attached to the continent of America.

[1] Pennant, A Z. lxiii.

* Iceland is ſaid to have ſuffered greatly by commercial monopoly, but the company was ſuppreſſed in 1759. Buſching, i. 417. Every benefit ought certainly to be extended by the Daniſh government to the poor inhabitants of ſo remote and barren a country.

In 1784 a terrible mortality carried off 19,488 horſes, 6,800 beeves, 129,947 ſheep. Catteau, i. 131, ſeemingly exaggerated.

The cod fiſhery near Iceland begins at the point of Brederwick, and ends at that of Langerneſs, running by Cape North and the Iſle of Grims, and occupying more than two hundred Dutch veſſels and about eighty French. *Kerguelen, Voyage dans la Mer du Nord*, Paris, 1771, 4to. p. 51.

When

When the author was at Paris that diſtinguiſhed entomologiſt, and learned profeſſor at Kiel, Fabricius, communicated ſome obſervations on the account of Denmark, which, as he wrote them in the Engliſh language, ſhall here be given in his own words.

"Within the laſt twenty years the agriculture of Denmark is greatly bettered. We have introduced liberty and property amongſt our farmers, and they have begun in conſequence to build their houſes on their eſtates; to divide and to incloſe their lands, and to work them with much more induſtry. The products are thereby certainly doubled, and in many places perhaps tripled.

"The iſlands are particularly fruitful. They are flat, and conſiſt of a good clay, more or leſs mixed with ſand and lime. They produce particularly great quantities of grain of all ſorts, not only ſufficient for our own conſumption, but of which we ſell a great deal to foreigners.

"Jutland is leſs fruitful, particularly the weſt coaſt, and the middle. It is ſandy, has much heath, but produces a quantity of rye and of buck-wheat, and beech-wheat (*phagopyrum*), upon which the inhabitants chiefly ſubſiſt. The eaſt coaſt, on the contrary, is a fine fruitful country, of which the greateſt part is laid out for cattle. It produces a great quantity of oxen, which they fatten in the ſummer on the rich marſhes of Holſtein, and drive in the autumn to Hamburg. It produces likewiſe a number of horſes, which, under the name of Holſtein horſes, are well known. Schleſwig and Holſtein are very different countries. The weſt coaſt, from the river Elbe to Jutland, is taken in from the ſea, or what we call *Morſtur*. It is low, flat, without ſtone, hill, or tree; and conſiſts of a very fine fruitful blue clay. It produces in abundance wheat, barley, coal, &c. A great part is laid out in graſs, where they fatten the oxen which they buy every ſpring in Jutland, and ſell afterwards at Hamburg.

"The middle is more ſandy, here and there overrun with heath; but it has many inland ſeas, and ſmall rivers, and there is no want of water, it produces rye, oats, and *phagopyrum* in quantity.

"The eaſtern coaſt is diverſified with ſmall hills, overgrown with trees, extremely pleaſant and fruitful. It conſiſts of a yellow clay,

more or leſs mixed with ſand, and produces rich harveſts of all kinds. A great part is laid out for graſs to feed the number of cows, for the produce of butter, which is perhaps better and keeps better than any in Europe. We have a great number of ponds for fiſh, particularly carp, but formerly there were ſtill more. They have dried them, and find it of more advantage to cultivate them. We have manufactures of different kinds. The chief manufacture in Jutland is wool. In all the other parts they have a coarſe kind of wool, from the ſheep on the heath, and of this they make carpets, ſtockings, gloves, and other coarſe woollen goods. We have ſome manufactures of cloth, of which the finer ſorts are really good, and not too dear; but the coarſer in proportion worſe and dearer.

" The women of whole diſtricts of Schleſwig are employed in making laces, a manufacture introduced by the refugees of Brabant, and which has greatly extended itſelf. We ſupply the greateſt part of the northern and eaſtern kingdoms with laces; and a great part is ſold as being from Flanders.

" Some linen is made, but only for home conſumption; and it is far from being ſufficient for that purpoſe.

" Of ſilk and cotton we have little. We make ſome ſtockings, ribbons, and other trifles, but not enough for our own conſumption.

" Of pottery we have ſome good manufactures; that of porcelain at Copenhagen is well known.

" We make all that belongs to the army, guns, muſquets, powder, ſwords. In the time of war we ſend part of them to foreign markets. Sugar houſes for refining ſugar we have many; and enough of that article for home conſumption.

" Authors we have in every ſcience, and really many excellent ones; but our country is ſmall, and the number of our readers not great, and therefore muſt the number of our writers likewiſe be ſmall.

" In juriſprudence, Nourregaard.
Medicine, Culliſen, Herboldt.
Natural hiſtory, Vahl, Abildgaard, Fabricius.
Hiſtory, Hayewiſh, Suhm lately dead.
Antiquities, Mynter.

Philoſophy, Rheinholdt.
Statiſtics, Schlegel, Wiemann, Fabricius.
Poets, Baggeſen, Guldberg, Heiberg, Rahbeck.
Painters, Juel, Hoyer, Poulſen, Myller.
Architects, Haſdorgh, Hanſſen.
Engraver, Preidler."

SWEDEN.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

NAMES.

SWEDEN, in the native language Suitheod, and more modernly Sweireke, appears to be a very ancient appellation, and is said, by the northern antiquaries, to imply a country whose woods had been burnt, or destroyed. The name seems as ancient as the time of Tacitus,[1] who, after describing the Suiones who lived in islands of the ocean, passes to the Sitones, and afterwards to the nations at the further end of the Baltic. It is evident that Cluverius has in this, as in other instances relative to the north of Europe, been blindly followed by D'Anville, and other geographers, who suppose that the Sitones are the Danes or Norwegians, and the Suiones the Swedes. The learned Huet,[2] on the contrary, well perceived that the Suiones must be on the west; though he err in placing them in Norway, which was almost unknown to the ancients. The Sitones must have dwelled in the southern provinces of Sweden; and the name either have been derived from Sictuna, the old name of the chief town, as

[1] German. c. 44, 45.

[2] Commerce des Anciens, ch. xlii. p. 234.

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SWEDEN
and
NORWAY.
North Cape
Varanger Fiord
West Fiord
KEMI
Gov. of ARCHANGEL
TORNEA
LAPPMARK
WASTERBOTTEN
LULEA
LEAHOB
UMEA
ASELE
JAMTLAND
WASTERNORRLANDS
ANDERMANLAND
Trondheim
Christiansund
Stadtland
Doffrefeld
BERGENHUS
BUSKERUD
CHRISTIANIA
CHRISTIANSAND
STAVANGER
MEDELPAD
GEFLEBORGS
HELSINGLAND
STORA KOPPARBERGS
DALARNE
GASTRIKLAND
UPLAND
WERMLAND
WESTERMANLAND
DALSLAND
NERIKE
SODERMANLAND
WASTERGOTLAND
ELFSBORGS
GOTLAND
SMALAND
KRONOBERGS
BLEKINGE
SKANE
MALMO
Sea land
HK
Bornholm
Gulf of Finland
Aland
WASSA
TAVASTLAND
BJORNEBORGS
ABO
NYLANDS
KUOPIO
KARELIA
Gov. of REVEL
ESTHONIA
Gulf of RIGA
RIGA
KURLAND
SEMGALLEN
Gov. of RIGA
Gulf of Finland
Baltic Sea
Sound
Copenhagen
Roskil
Kiel
Lubeck
Hamburg
Danzig
Konigsberg
Stettin
Stralsund
Rostock
Wismar
Bremen
Emden
Groningen
Leeuwarden
Hague
Amsterdam
Utrecht
Arnhem
Nimeguen
Cologne
Wesel
Minden
Hanover
Brunswick
Magdeburg
Berlin
Potsdam
Frankfort
Dresden
Leipsic
Wittenberg
Cottbus
Breslau
Glogau
Posen
Bromberg
Thorn
Plock
Warsaw
Lublin
Kiev
Kaluga
Moscow
Tobolsk
Tomsk
Longitude East from Greenwich
Arrowsmith dirxit
From Pontoppidan and Hermelin
Published March 1st 1806 by Cadell and Davies, Strand; and Longman and Rees, Paternoster Row.

[illegible] from Ariani of Linnæus, or from Suitheod the native term. [illegible]
[illegible] usual by the Roman enunciation.

[illegible] kingdom of Sweden [illegible] very considerable extent, being, [illegible] the most southern promontory of Stone, to the northern extremity of Swedish Lapland, not less than 1150 British miles in [illegible]; and from the Norwegian Alps to the limits of Russia, about [illegible]. The contents in square miles have been computed [illegible]; the inhabitants being some years ago supposed 2,977,[illegible] there [illegible] fourteen to the square mile, including Swedish Pomerania comprising 1440 square miles, and 10[illegible],325 inhabitants.

[illegible] there is no evidence that the Celtæ ever penetrated to Scandinavia, [illegible] Original Population.

[illegible] population appears to have consisted of Finns, who, perhaps [illegible] eight centuries before the Christian æra, were supplanted by [illegible] Goths, mythologically represented as having been conducted by [illegible] or the god of war. These Goths gradually proceeded from [illegible] native seats in the north of Persia, and along the Euxine; and [illegible] one division passed to the west, or into Germany, [illegible] in a [illegible]ern progress reached Scandinavia, [illegible] since extended, the population [illegible] pure Gothic [illegible] [illegible]ern parts; while in the north there are remains of the Finns; above them the Laplanders, a native diminutive race resembling the Samoieds of the north of Asia, and the Esquimaux and Greenlanders, Arctic races of America. If any tribes [illegible] it is probable that the inhabitants [illegible] and manners resembling those [illegible] The [illegible]nders are, however superior to the [illegible] they have intermarried [illegible] their language being originally [illegible] and ideas were few, they have [illegible] Finns their neighbours.

[illegible] the southern parts of Scandinavia being [illegible], [illegible] reflive geography is rather obscure. [illegible] there [illegible]

[illegible] Swedish mile is nearly seven English, being ten [illegible] A [illegible] equal to eight or nine English.


SWEDEN
and
North Cape
Dyrø
Vardø
Kola
Wardhuus
Tornea
Sorrow
W. Friesland
Greenwich direct

appears from Adam of Bremen, or from Suitheod the native term, softened as usual by the Roman enunciation. Name

The kingdom of Sweden is of very considerable extent; being, from the most southern promontory of Scone, to the northern extremity of Swedish Lapland, not less than 1150 British miles in length; and from the Norwegian Alps to the limits of Russia about 600.* The contents in square miles have been computed 208,912; and the inhabitants being some years ago supposed 2,977,345, there will be fourteen to the square mile, including Swedish Pomerania computed at 1440 square miles, and 103,345 inhabitants. Extent.

As there is no evidence that the Celts ever penetrated to Scandinavia, the first population appears to have consisted of Fins, who, perhaps seven or eight centuries before the Christian æra, were supplanted by the Goths, mythologically represented as having been conducted by Odin, or the god of war. These Goths gradually proceeded from their native seats in the north of Persia, and along the Euxine; and while one division passed to the west, or into Germany, another in a northern progress reached Scandinavia, where no foreign conquest having since extended, the population continues purely Gothic in the southern parts; while in the north there are remains of the Fins; and above them the Laplanders, a native diminutive race resembling the Samoieds of the north of Asia, and the Esquimaux, and Greenlanders, Arctic races of America. If any isles exist near the south pole, it is probable that the inhabitants will be found of diminished size, and manners resembling those of the northern progeny. The Laplanders are however superior to the Samoieds, or Esquimaux, because they have intermarried with the Fins, a race of greater dignity; and their language being originally very rude and barren, as their wants and ideas were few, they have in a great measure adopted that of the Fins their neighbours. Original Population.

Only the southern parts of Scandinavia being known to the ancients, its progressive geography is rather obscure. The only people there Progressive Geography.

* The Swedish mile is nearly seven English, being ten and two-fifths to a degree. A Norwegian mile is equal to eight or nine English.

situated

Progressiva Geography.

ſituated known to Tacitus were the Sitones. Pliny appears to have confounded the knowledge of the ancient Greeks concerning Britain and Ireland, with that of the Romans concerning the Baltic; but he expreſsly names Scandinavia, a part of which was inhabited by the Hilleviones, perhaps in the ſouth of Norway, or in Halland, while his Eningia is probably the ſouth weſtern ſhore of Gothland, which the Romans, deceived by the intervening gulph of Chriſtiana, ſuppoſed to be another iſland. Ptolemy mentions five or ſix tribes, among which are the Gutæ of Gothland, as inhabiting the portion of Scandinavia known in his time; which, from the ſize he aſcribes to it, could not have paſſed the lakes Wenner, and Weter. His four Scandinavian iſlands are evidently thoſe of Zealand, Funen, Laland, and Falſter. After this period there is little progreſs in Scandinavian geography till the time of Jornandes, in the ſixth century, who deſcribes Scanzia, or Scandinavia at ſome length, and mentions various nations by whom it was inhabited.* The next notices are due to the voyages of Ohter, recited by our great Alfred; and the more certain and general knowledge begins to dawn with Adam of Bremen, and the Icelandic hiſtorians.

Hiſtorical Epochs.

The following ſeem to conſtitute the chief hiſtorical epochs of Sweden.

1. The early population by the Fins and Laplanders.

2. The conqueſt by the Goths.

3. What little knowledge the ancients poſſeſſed concerning the ſouth of Scandinavia.

4. The fabulous and traditional hiſtory, which begins about the year of Chriſt 520, and includes the conqueſt of Sweden by Ivar Vidfatme king of Denmark about A. D. 760. Hence there is an obſcure period till the reign of Biorn I, A. D. 829, commemorated, with his immediate ſucceſſors, by Adam of Bremen.

5. The conqueſt of Denmark by Olaf II about the year 900.

* The names are corrupt, but might like the whole of this author, be greatly improved from the Ambroſian MS., whoſe various readings are publiſhed by Muratori in the firſt vol. of his Italian hiſtorians. In a new edition that MS. ſhould be adopted as the text, and the few various readings that are worth preſervation ſhould be given on the margin.

6. The

6. The reign of Ingi the pious, A. D. 1066, after which the history is sufficiently clear as the Danish is after Gormo A. D. 920. Lagerbring, one of the best native historians, divides the ancient kings into the Ynglingian race the most ancient in traditional report; and which terminated at the conquest by Ivar Vidfatme, who was succeeded by his grandson Harold Hildetan, and his great grandson Sigurd Ring: followed by another branch called the race of Sigurd. Historical Epochs.

7. The partial conversion of Sweden to Christianity, in the reign of Olaf III, A. D. 1000: but more than half a century elapsed before Paganism can be considered as finally abandoned, in the reign of Ingi the pious; whose father Stenkil is regarded as the founder of a new dynasty, though he sprung from the house of Sigurd. But the crown was now considered as having become elective.

8. The accession of the Folkungian branch, about the middle of the thirteenth century.

9. The Swedes, discontented with their king Albert of Mecklenburg, in 1388 elect as their sovereign Margaret heiress of Denmark and Norway. Thus ended the Folkungian race: and by the celebrated treaty of Calmar, A. D. 1397, the three kingdoms of the north were supposed to be united for ever. But after the death of Margaret in 1412, the Swedes began to struggle for their liberty; and in 1449 Karl or Charles VIII was elected king of Sweden: having assailed the property of the church, he was forced to leave the kingdom 1457, but was afterwards restored.

10. The struggles between Denmark and Sweden, till the cruel and tyrannic reign of Christiern II, king of Denmark, Norway, and Sweden.

11. Tyrants are the fathers of freedom. Gustaf Wase, whom we style Gustavus Vasa, delivers his country from the Danish yoke, after a contest which forms one of the most interesting portions of modern history. The revolt may be considered as having commenced when Gustaf appeared at Mora, in Dalecarlia, A. D. 1520, and completed three years afterwards, when he entered Stockholm in triumph. Dissatisfied with the power of the clergy, which had repeatedly subjugated the kingdom to Denmark, this great prince, 1527, introduced the Reformed

Historical Epochs.

formed religion; and died in his ſeventieth year, Sept. 1560, after a glorious reign of thirty-ſeven years.

12. The reign of Guſtaf Adolph, or Guſtavus Adolphus, A. D. 1611—1631. Auſtria, Spain, and the other Catholic kingdoms, having conſpired to extirpate the proteſtant religion in Germany, this king was invited to aſſiſt the reformed; and carried his victorious arms to the Rhine, and the Danube. His daughter Chriſtina, a pedant in petticoats, having formed a claſſical attachment to Italy, abandoned the Swediſh throne, and embraced the Catholic religion, which her father had ſo ſtrenuouſly oppoſed.

13. The reign of Charles XI, 1660—1697, when the arts and ſciences began to flouriſh; and the power of the kingdom was carried to its utmoſt height. This reign of ſolid beneficence was followed by the calamitous ſway of that madman Charles XII, whom Pope was ſo ill informed as to aſſimilate with Alexander the Great, whoſe conqueſts were conducted upon principles wholly the reverſe, and were crowned by eſtabliſhments directed by an enlarged mind, capable of views of eternal benefit and duration.

14. After the weak reign of Charles XII, Sweden ſunk into political humiliation; and is now regarded as little better than a province of Ruſſia, to which diſgrace the Swediſh ariſtocracy as naturally tends as that of Poland. In a poor ſtate, under that form of government, it is natural that the leaders ſhould ſell their country to a neighbouring power, except ſeverely guarded as at Venice; and the revolution under Guſtaf III 1772 muſt be conſidered as beneficial to Sweden. For the Ruſſians, by the corruption of the ariſtocracy, had almoſt ſubjected the kingdom: when the ſovereign, aſſiſted by the counſels and money of France, then inimical to Ruſſia the ally of England, accompliſhed his victory over the nobles. The aſſaſſination of that prince, and the ſubſequent events are little momentous in a general point of view; and, though more free from Ruſſian intrigue, Sweden bends in terror before that powerful name.

Antiquities.

The ancient monuments of Sweden conſiſt chiefly of judicial circles, and other erections of unhewn ſtone, followed by the monuments inſcribed

inſcribed with Runic characters, ſome of which are as recent as the fifteenth century, and none of them can ſafely be dated more anciently than the eleventh.* Not far from Upſal is the moraſten or ſtone on which the king uſed to be enthroned, as the old Scotiſh monarchs were at Scone. The ancient temples, called Skior, or Skur, were of wood, and have conſequently periſhed. Of the old churches and caſtles, erected ſince the uſe of ſtone, Dahlberg has engraved many;[1] and ſome of the latter are remarkable for their reſemblance to what are called Pictiſh caſtles in Scotland.

ANTIQUITIES.

* Maupertuis, in his journey to Lapland, deſcribes the monument of Windſo, which he ſays contains the moſt ancient inſcription in the world! This ſtone, with a Runic inſcription, ſeems to have been erected in the fourteenth or fifteenth century, during which Runic inſcriptions abounded even in the church-yards of Scandinavia, to denote ſome boundary, perhaps that then exiſting between Daniſh and Swediſh Lapland.

[1] Suecia antiqua et hodierna.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

RELIGION. Ecclesiastic Geography.

THE religion of Sweden is the Lutheran, and this kingdom has retained an archbishopric, a pre-eminence abolished in Denmark; with thirteen prelacies. The parishes amount to 2,537. The priests are computed at 1,378; with 134 vicars, and 192 prepositi, or inspectors.[1] Some of the parishes are very extensive, as that of eastern Bothnia, which is about 150 miles in length by 48 in breadth; and another parish in Lapland is still larger. A consistory of the clergy of the diocese elects the archbishops, and the bishops, by presenting three to the king for his nomination. Some of the parishes are under the royal patronage; others in the gift of individuals: but many are called consistorial, and the priest is appointed by the votes of his brethren.

Government.

The revolution of 1772 pretended to restore the government to the form established by Charles XI; and which had lapsed into a factious mixture of aristocracy. But by the act of union, 1789, the constitution became an absolute monarchy; the monarch having arrogated not only the rights of peace and war, and the administration of justice, but the imposition of taxes, without the consent of the diet, which cannot deliberate on any subject till it be proposed by the sovereign. The diet consists of nobles, and landed gentlemen, clergy, burgesses, or deputies of towns, and those of the peasantry. Each of the four states has a speaker; the archbishop of Upsal being always the speaker of the clergy, while the king nominates the others. The diet of 1786

[1] Olivarius Le Nord Litteraire, No. 12.

consisted

consisted of 49 counts, 136 barons, 188 knights, 396 gentlemen, 51 ecclesiastics, 94 burgesses, and 165 deputies of the order of peasants.[1] As the monarch is not opulent, it is evident that so large and respectable a body might constitute a formidable barrier; but the evils of faction have been so great and impendent, and the Russian power and influence so destructive to the very existence of the state, that the deputies seem justly to regard the dictatorial power of the monarch as necessary for their own preservation. Government.

When the great extent of the Swedish territory is considered, the population will appear comparatively small; a circumstance arising in part from the mountainous nature of the country, and in part from the severe climate of the northern districts; Swedish Lapland being supposed not to contain more than 7000 inhabitants. Yet at present the population of the kingdom is thought to exceed 3,000 000. The nobility are so numerous as to be computed at about 2,500 families; while the peasants, the most numerous class, amount to about 2,000,000. This great number of nobility was connected with the aristocratic form of the government, which bore a semblance to that of Poland, and Hungary, the latter kingdom still remaining too aristocratic for the regular distribution of good government through all the classes of the community. The example of Poland will, it is hoped, convince these aristocracies that the transition of their power to the monarch is indispensably necessary for their own preservation.* Population.

[1] Olivarius Le Nord Litteraire, No. 12.

* Olivarius computes the population in the following manner, from the enumeration made in 1784.

Nobility. Individuals from the age of 15 to 63, men 3869, women 2865, children 1904; individuals above and under those ages 8200; domestics 27,263.

Burgesses. Individuals from the age of 15 to 63, men 28,492, women 23,563, children 11,068; individuals above and under those ages 60,500; domestics 31,868.

Clergy. Individuals from the age of 15 to 63, men 5663, women 4120, children 2775; individuals above and under those ages 12,000; domestics 15,930.

Public Officers, including the military. Individuals from the age of 15 to 63, men 23,872, women 18,230, children 8823; individuals above and below those ages 48,700; domestics 41,809.

Peasants. Individuals from the age of 15 to 63, men 320,772, women 296,664 children 257,213; individuals above and below those ages 813,500; domestics 195,338.

Colonies. Sweden only poſſeſſes one ſmall colony, that in the iſland of St. Bartholomew in the Weſt Indies, which was ceded to them by the French in 1785.[1]

Army. The Swediſh army conſiſts of national troops, and of foreign infantry, the latter being computed at about 12,000. The total amount of the army may be 48,000; and the ſoldiers are of diſtinguiſhed valour and hardihood, and elated with the former fame of the Swediſh arms. But on a late invaſion of the Ruſſian dominions they were found to be more obedient to the ariſtocracy, than to their ſovereign.

Navy. So fatal were the naval operations of 1792 that the Swediſh fleet, which conſiſted of 30 ſhips of the line, cannot now diſplay above half that number. In the Baltic, which is full of low coaſts and ſhoals, gallies of a flat conſtruction are found more ſerviceable than ſhips of war, and of courſe great attention is paid to their equipment by Sweden as well as Ruſſia.

Revenue. The revenue of Sweden is computed at about a million and a half ſterling; which is equalled by the expences of the government. The national debt cannot be much leſs than 10,000,000 ſterling, as it was augmented during the late regency; but the young monarch is anxious for its reduction. This debt being chiefly incurred at Hamburg, the country is overwhelmed with the paper money of that city; and the ſcarcity of gold and ſilver, and even of copper currency, is incredible. The ducat is the only gold coin, worth about nine ſhillings ſterling; while the ſilver crown may be valued at four ſhillings and ſixpence. The ſchelling, or ſhilling, is worth little more than one penny ſterling; and the copper conſiſts of half and quarter ſhillings, the ancient heavy pieces being now rarely viſible, and ſupplanted by bank-notes, ſome of which are for very diminutive ſums.

Political Importance and Relations. The political importance and relations of this kingdom are much diminiſhed, ſince the glorious reign of Guſtaf Adolph, and the beneficent ſway of Charles XI. Prior to the late revolution in France Sweden had remained a faithful ally of that kingdom, which excited

[1] Olivarius Le Nord Litteraire, No. 12.

her

Political Importance, &c.

her against any enemies in Germany, as Scotland was formerly involved in the wars between France and England. Of late this alliance seems to be sacrificed to a more useful connexion with Denmark, and Prussia, which can alone guard the north of Europe from the progress of the Russian preponderance. The disorder of the finances unites with many causes of discontent, both among the aristocracy and among the peasantry, to render the power of Sweden little apparent in the political balance of Europe.

CHAPTER III.

Civil Geography.

Manners and Customs. — Language. — Literature. — Education.—Universities.— Cities — Towns. —Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

Manners and Customs.

THE manners and customs of the superior classes in Sweden are so much tinged with those of the French, their allies, that no striking peculiarity can be observed; and even the peasantry have so much vivacity and address, that they have been styled the French of the north. The complexion, which in the northern latitudes is generally fair, is here much diversified, being in some provinces extremely brown. The men are commonly robust, and well-formed; and the women slender and elegant. Their attachment to luxury is, in some measure, compensated by their love of hospitality. The peasants in general make their own furniture and clothes; trade and manufactures having made very little progress. The natives of the western province of Dalecarlia retain many ancient customs, and have been distinguished for their courage and probity, since the time that Gustaf Wase issued from the mines of that country to break the yoke of Denmark. The Finlanders, on the east of the Bothnic gulph, are now little distinguishable from the Swedes; and any remarkable peculiarities of manners and customs must be sought in Swedish Lapland, which has long since been described by Scheffer, whose work was translated into English, and rendered more familar by an extract in the Spectator.[1] Danish Lapland being more remote, less known, and more recently described, an account of this singular people is given under the article of Denmark.

[1] See also the descriptions by Maupertuis, Kalm, Coxe, Consett, &c.

The

The language of Sweden is a dialect of the Gothic, being a ſiſter of the Daniſh, Norwegian, and Icelandic. In the two grand diviſions of the Gothic, conſiſting of the German and Scandinavian dialects, the latter is diſtinguiſhed by great brevity and force of expreſſion. In the ſouth of Sweden, which contains the chief maſs of population, ſome German and French words have been adopted; while the Dalecarlian on the N. W. is eſteemed a peculiar dialect, perhaps only becauſe it contains more of the ancient terms and idiom. The Finniſh gradually yields to the Swediſh; but the rude Laplander retains his old ſpeech, or rather a dialect of the Finniſh adopted by his anceſtors. The Swediſh language is ſufficiently ſonorous, if the pronounciation were more emphatic. The affectation of terminating names in *us*, as if they were Latin, begins gradually to expire after a ridiculous reign of two centuries. Language.

In the antiquity of literature Sweden cannot pretend to vie with Denmark, Norway, or Iceland: the moſt early native chronicle, or perhaps literary compoſition, being not more ancient than the fourteenth century. In return, while the Danes ſeem occupied with internal policy and public regulation, the Swedes have, in modern times, borne the palm of genius in many departments of literature and philoſophy. One of the moſt remarkable names of Sweden, prior to the reformation, was that of St. Brigit, who flouriſhed in the middle of the fourteenth century, and whoſe pretended prophecies were collected with great care, and publiſhed in Latin. When the biſhops were expelled from the kingdom by Guſtaf Waſe, John and Olaus Magnus retired to Rome, where the one publiſhed a fabulous deſcription of Scandinavia; while the other gave to the world a yet more fabulous hiſtory of his native country. But Swediſh literature can hardly be ſaid to have dawned till the middle of the ſeventeenth century, when the queen Chriſtina, finding the country immerſed in ignorance, invited Grotius, Deſcartes, and other celebrated men, who, though they did not reſide long in the kingdom, yet ſowed the ſeed of letters, which gradually began to proſper in the wiſe and beneficent reign of Charles XI. In the ſucceeding or laſt century the name of Linnæus alone might diſtinguiſh the national literature; and it is joined in Literature.

LITERATURE.

natural hiſtory with thoſe of Tilas, Wallerius, Quiſt, Cronſtedt, Bergman, and others. In hiſtory Dalin and Lagerbring have diſtinguiſhed themſelves by a preciſion and force, which the Danes ſeem to ſacrifice to antiquarian diſcuſſions. Sweden alſo boaſts of native poets and orators; and the progreſs of the ſciences is ſupported by the inſtitution of numerous academies.

Education.

The manner of education has, as uſual, been neglected by travellers and geographers, though perhaps one of the moſt important branches in the whole circle of human affairs. Compared with this primary foundation, an enumeration of univerſities is of ſmall conſequence. That of Upſal is the moſt ancient and renowned, containing about 500 ſtudents; while that of Lunden preſents about 300. A third is at Abo in Finland, frequented even by ſtudents from Ruſſia; and the whole number is computed as equalling that of Upſal. There are beſides twelve literary academies, moſt of which publiſh memoirs of their tranſactions. The library at Upſal is richly furniſhed with books remitted by Guſtaf Adolph, when his victorious arms penetrated deeply into Germany, Sweden having thus acquired by war the firſt materials of her literary fame.

Univerſities.

Cities and Towns. Stockholm.

Stockholm, the capital of Sweden, ſtands in a ſingular ſituation between a creek, or inlet, of the Baltic ſea, and the lake Mæler. It occupies ſeven ſmall rocky iſlands, and the ſcenery is truly ſingular and romantic. "A variety of contraſted and enchanting views is formed by numberleſs rocks of granite, riſing boldly from the ſurface of the water, partly bare and craggy, partly dotted with houſes or feathered with wood."[1] Somewhat reſembling Venice, but with greater diverſity of proſpect, it requires no fortifications. Moſt of the houſes are of ſtone or brick, covered with white ſtucco; except in the ſuburbs, where ſeveral are of wood painted red, as uſual in the country of Sweden. This city was founded by the earl Birger, regent of the kingdom, about the middle of the thirteenth century; and in the ſeventeenth century the royal reſidence was transferred hither from Upſal. The entrance to the harbour is through a narrow ſtreight, of ſomewhat difficult acceſs, eſpecially as there are no tides: and for

[1] Coxe, iv 33.

four months in the year it is frozen. It is however deep, and capable of receiving a great number of veſſels. The royal palace ſtands in a central and high ſituation; and there are a caſtle, an arſenal, and ſeveral academies. The manufactures are few, of glaſs, china, woollen, ſilk, linen, &c. By the lateſt accounts the population of Stockholm may be eſtimated at 80,000. Cities and Towns.

Next in dignity is Upſal, the only archbiſhopric, and formerly eſteemed the chief city of the kingdom; but at preſent the inhabitants, excluſive of the ſtudents, do not exceed 3000.[3] Upſal.

Gotheborg, or Gothenburg, in the province of Weſt Gothland, is eſteemed the ſecond city in Sweden, having a population of 20,000, though it was only founded by Charles IX, or rather by Guſtaf Adolph. Beſides conſiderable commerce, the herring fiſhery contributes to enrich Gothenburg.[4] The ſtreets are uniform; and the circumference is computed at near three miles: but the fortifications are ſo weak that in 1788 it muſt have fallen into the hands of the Danes, had it not been for the interference of foreign powers. Gothenburg.

Carlſkrona was founded by Charles XI in 1680. This city, and Stralſund, in Swediſh Pomerania, are ſuppoſed each to contain about 11,000 inhabitants. Abo, in Finland is computed at 8,750; in which number it is nearly rivalled by Nordkioping. Fahlun is the next in population; and is followed by Wiſmar, another town poſſeſſed by Sweden, on the northern ſhore of Germany. None of the other towns contain more than 4,000 inhabitants. Carlſkrona.

Even including the royal palaces, Sweden cannot boaſt of many ſplendid edifices. The roads are in general far ſuperior to thoſe of Denmark and Norway, which ſeem unaccountably neglected, good roads being the very ſtamina of national improvement. Yet the internal communication, even in Sweden, is impeded by bad arrangements.[5] Edifices.

Of late a laudable attention has been paid to inland navigation; and the chief effort has been to form a canal between Stockholm and Gothenburg. In this canal, ſtyled that of Trolhata, conducted along the river Gotha, ſtupendous excavations have been made through Inland Navigation.

[3] Coxe, ix. 175. [4] Ib. iv. 323. [5] Olivarius Le Nord. Lit. No. 12.

INLAND NAVIGATION.

the granitic rocks, in order to avoid cataracts; one of which, of more than 60 feet, is called the Infernal Fall. Yet the plans have repeatedly failed, from the ignorance of the engineers; and the first expence ought to have been to procure a superintendant of real skill from England. The intention was to conduct an inland route from the Meler lake to that of Hielmer, and thence to that of Wener; and by the river Gotha, an outlet of the latter, to the Skagger Rack and German sea. This grand design is already in some measure completed; and in the year 1800 the rivers and old canals of Finland were ordered to be cleared; but in that region the ice affords the easiest mode of communication.*

Manufactures and Commerce.

The Swedish manufactures are far from being numerous, consisting chiefly of those of iron and steel; with cloths, hats, watches, and sail cloth. The manufactures of copper and brass, and the construction of ships, also occupy many hands. In 1785 it was computed that 14,000 were employed in those of wool, silk, and cotton. Of native products exported, iron is the most considerable; and it is said that the miners in the kingdom are about 25,600.

The commerce of Sweden rests chiefly on the export of their native products, iron, timber, pitch, tar, hemp, and copper. Herrings also form a considerable article. Part is also transferred to other nations of the goods imported by Swedish merchants, from the isle of St. Bartholomew in the W. Indies, and from China. The chief import is corn of various kinds, particularly rye, Sweden rarely affording a sufficiency for her own consumption; with hemp, tobacco, sugar, coffee, drugs, silk, wines, &c. Mr. Coxe has published a table of the Swedish commerce, whence it appears that the exports then amounted to 1,368,830l. 13s. 5d., and the imports to 1,008,392l. 12s. 4½d., so that the balance in favour of Sweden was about 360,000l.

* The noble canal of Trolhata is now completed with prodigious labour and expence. A beautiful print has been published of the manner of conducting the operations through the prodigious rocks of granite. In 1801 there passed through this canal thirteen hundred and eighty ships of different sizes, laden with iron, steel, timber, herrings, grain, flour, &c. *Journal des Mines*, No. lxv. p. 404.

CHAPTER. IV.

NATURAL GEOGRAPHY.

Climate and Seasons. — Face of the Country. — Soil and Agriculture. — Rivers.— Lakes. — Mountains. — Forests. — Botany. — Zoology. — Mineralogy. — Mineral Waters. — Natural Curiosities.

CLIMATE AND SEASONS.

THe different parts of Sweden present considerable varieties of temperature, but even in the middle regions winter maintains a long and dreary sway. The gulph of Bothnia becomes one field of ice; and travellers pass on it from Finland by the isles of Aland. In the most southern provinces, where the grand mass of the population is centered, the climate may be compared to that of Scotland, which lies under the same parallel; but the western gales from the Atlantic, which deluge the Scotish Highlands with perpetual rain, and form the chief obstacle to improvement, are little felt. In the north the summer is hot, by the reflexion of the numerous mountains, and the extreme length of the days; for at Tornea, in West Bothnia,* the sun is for some weeks visible at midnight; and the winter in return presents many weeks of complete darkness. Yet these long nights are somewhat relieved, by the light of the moon, by the reflexion of the snow, and by the Aurora Borealis, or northern lights, which dart their ruddy rays through the sky, with an almost constant effulgence. Of late years it has been remarked that the spring is more cold than formerly; yet at Stockholm the tulips blow at Whitsunday. Beyond Geffle fruit trees are rare. In a further latitude the beech disappears; and the oak dwindles, till it is followed by the birch, a tree which seems the most capable of bearing cold.

* Tornea is not in Lapland, but in West Bothnia, which forms an angle far to the north (see the map,) and is inhabited by Finns.

Face of the Country.

No country can be diverſified in a more pictureſque manner, with extenſive lakes, large tranſparent rivers, winding ſtreams, wild cataracts, gloomy foreſts, verdant vales, ſtupendous rocks, and cultivated fields.

Soil and Agriculture.

The ſoil is not the moſt propitious; but agriculture is conducted with ſkill and induſtry, ſo as much to exceed that of Germany, and Denmark. Even Finland preſents many rich paſtures, and not a few fields of rye, oats, and barley. It is ſuppoſed that in the ſouth of Sweden by draining and other improvements, a ſufficient quantity of wheat might be raiſed for the ſupply of the kingdom.

Rivers.

Sweden is interſected by numerous rivers, the largeſt of which are in the native language called Elbs, or Elfs. The moſt conſiderable flow from the lakes, without any great length of courſe; ſuch as the Gotha, the only outlet of the vaſt lake of Wener, but unhappily impeded by many rocks and cataracts. Many other rivers in the ſouth rather aſſume the form of creeks, and outlets of the lakes, as the Motala, which is the outlet of the lake Weter paſſing by Norkioping: and ſcarcely can a ſtream be named of conſiderable courſe, till we reach the river Dahl, the moſt important in Sweden, conſiſting of two conjunct ſtreams, the eaſtern and weſtern Dahl, which riſe in the Norwegian Alps, give name to the province of Dalarn, or Dalecarlia; and after a courſe of about 260 Britiſh miles enter the Bothnic gulph, about 10 miles to the eaſt of Geffle, preſenting, not far from its mouth, a celebrated cataract, eſteemed little inferior to that of the Rhine at Schaffhauſen, the breadth of the river being near a quarter of a mile, and the perpendicular height of the fall between 30 and 40 feet.[1] The ſurrounding ſcenery alſo aſſiſts the effect, which is truly ſublime.

Dahl.

Further to the north, and in Swediſh Lapland, are many conſiderable rivers, which alſo riſe from the Norwegian Alps, and flow into the gulph of Bothnia, after circuits of about 200 miles. But the Tornea belongs to Bothnia Proper: it ſprings from a lake of the ſame name; and after receiving the Kengis, and other conſiderable rivers, joins the northern extremity of the Bothnic gulf, having run about 300 Britiſh miles.

Tornea.

[1] Wraxall's Northern Tour, p. 158. Coxe, v. 99.

Finland

Finland is ſprinkled with numerous lakes, which give riſe to conſiderable ſtreams, but of a ſhort courſe, as the Ulea; the Cano which paſſes by Biormborg; and the Kymmen flowing into the centre of the gulph of Finland. Rivers.

Few countries can rival Sweden in the extent and number of lakes, which appear in almoſt every province. Of theſe the moſt important is the Wener, which is about 100 Britiſh miles in length, by 50 or 60 in breadth, in great part ſurrounded with foreſts, and rocks of red granite. It receives 24 rivers, abounds with fiſh, and contains many romantic iſles. Lakes. Wener.

Next is the Weter, a lake of equal length but inferior in breadth, which ſeldom exceeds 20 miles. This lake being ſurrounded with mountains is particularly ſubject to ſtorms in the ſtilleſt weather, whence ariſe many popular tales and ſuperſtitions: it contains two remarkable iſlands; and on the ſhores are found agates, carnelians, and touch-ſtones, or pieces of fine baſaltes.[2] The Weter is clear though deep; and while it receives about 40 ſmall rivers, has no outlet except the Motala. On its eaſtern ſhore ſtands the little town of Wadſtena, remarkable for a convent in which was preſerved the body of the Swediſh Brigit.* Weter.

The lake Meler, at the conflux of which with the Baltic is founded the city of Stockholm, is about ſixty Britiſh miles in length, by eighteen in breadth, and is ſprinkled with picturesque iſles. To the S. W. is the lake of Hielmar, more remarkable for its propoſed utility in the inland navigation, than for its extent. Meler.

Many other lakes are found in the north of Sweden, among which the moſt conſiderable is that of Stor, in the province of Jemtia. The chief lake of Lapland is that of Enara, in the furtheſt north, about ſeventy Britiſh miles in length, by thirty at its greateſt breadth. After this may be named thoſe of Hernaſba Staer, or the great lake, Tornea, and others. The lake and mountain of Niemi, and the river Tengilo, which falls into the Tornea, have been celebrated by Maupertuis for their picturesque beauty.

[2] Buſching, i. 549.

* The curious diary of this convent, which confiſted of monks and nuns, was publiſhed by the learned Benzelius at Upſal, 1721, 4to.

Lakes. The moſt conſiderable lake in Finland is that of Pejend, or Pajana, about 80 miles in length, by 15 in breadth, and which gives ſource to the river Kymmen. The lake of Saima to the E is yet more conſiderable; but it is chiefly within the Ruſſian dominions: this lake may perhaps, with its various creeks and communications, be eſtimated at 160 Britiſh miles in length, by 25 at its greateſt breadth; and flows into the Ladoga, by the great and noiſy current of Woxen, which forms a vaſt cataract about a mile from its mouth.[3]

Saima.

Mountains. Sweden may be in general regarded as a mountainous country; in which reſpect it is ſtrongly contraſted with Denmark Proper, or Jutland and the iſles. The chief mountains are in that elevated chain which divides Sweden and Swediſh Lapland from Norway; from which ſucceſſive branches run in a S. E. direction. The mountain of Swucku is ſuppoſed to be one of the higheſt of this chain, and is of a compact flaty freeſtone; but on the weſt there are maſſes of a different nature; and where it inclines to the lake of Fæmund, there are apertures from two to four fathom in width, and of an equal depth, but extending in length from two to three hundred ells.[4] Bergman alſo mentions the high mountain of Moſſevola, near the ſame lake, as being formed of a pudding-ſtone, conſiſting of balls of free-ſtone, with a few of hornblend and limeſtone, united by a ſandy cement.[5] The mountain of Rættvik he ſays is calcareous, and he eſtimates its height at 6000 feet above the ſea, obſerving, as a ſingularity, that upon this mountain and that of Rodaberg, are found vaſt blocks of reddiſh felſpar, mingled with quartz and brown mica. There alſo occur, on the mountain of Oſmund, enormous fragments of tranſparent felſpar, mingled with quartz and mica; though we muſt proceed to the high mountains of Norway to find ſummits more elevated than this laſt. Orology, or an exact account of mountains, was little ſtudied when Bergman publiſhed this work about 1770; but it would appear that the granitic ridge of the chain is in Norway; while the flanks, conſiſting as uſual of limeſtone, pudding-ſtone, and free-ſtone, verge

Swucku.

Moſſevola.

Rættvik.

[3] Buſching, i. 674.

[4] Bergman's Phy. Geog. in the Journal des Mines, No. xv.: in the French tranſlation Bergman computes the height of Swucku at 2,268 ells, that is about 9072 feet. Ib. p. 65

[5] Ib. p. 64.

into

into Sweden. The centre of the chain ſeems, as in the Alps and Pyrenees, to preſent the chief elevations, whence the mountains decline in height towards Lapland. Thoſe of Finland often contain rapakivi, being a brown mixture of felſpar and mica.[6] In the centre and ſouth of Sweden the red granite becomes very common. But in Weſtrogothia the mountains are often of trap. Mountains.

Further illuſtrations of the grand chain of mountains, which divide Sweden from Norway, will be found in the deſcription of the Daniſh dominions; and in conſidering the Swediſh mineralogy other hints will ariſe concerning the geology of the country.

The foreſts of this kingdom are numerous, and without their aid the mines could not be wrought. Dalecarlia, in particular, abounds with foreſts of birch, poplar, mountain aſh, pine, and fir; and the numerous lakes of Sweden are generally ſkirted with wood to the margin of the water. Foreſts.

Although the great Scandinavian peninſula be divided by its political intereſts between Denmark, Sweden, and Ruſſia, yet nature refuſes to acknowledge any ſuch diſtinction; it ſhall therefore be conſidered with reſpect to its botany as one great whole, nor can a ſketch of its indigenous plants be introduced anywhere with more propriety than in the deſcription of that territorial part of it which, in extent, is ſuperior to all the reſt, and which reckons amongſt its citizens the illuſtrious Linnæus, and ſeveral of his moſt eminent diſciples.* Botany.

The lowlands and lakes of Scandinavia are principally ſituated in the ſouth of Sweden and Finland, and the great ranges of Alpine mountains are found near the Arctic circle, or at leaſt are confined to the northern provinces; hence it is that Lapland, both from its elevation and its northern ſite, contains ſeveral plants which are not to be met with in the reſt of the peninſula.

Several ſpecies are common both to England and Scandinavia, and though the flora of Britain be the moſt copious of the two, yet the ſuperiority is not perhaps ſo great as might be expected from the difference of climate. If thoſe ſpecies that are natives of our chalk hills, and

[6] Bergman, 72. Kirwan, i. 345.

* Linnæus, Flora Suecica, and Flora Lapponica.—Grumerus, Flora Norwegica.

ſouthern

BOTANY. ſouthern coaſts, are for the moſt part wanting to Scandinavia, yet this laſt contains ſeveral German and Arctic plants which are not to be found in our own iſland.

Of timber trees there are but few ſpecies; the moſt common, and thoſe which conſtitute the wealth of Scandinavia, are the Norway pine, and the fir: of theſe there are immenſe foreſts ſpread over the rocky mountains, and deepening with their ſullen hue the whole horizon; thouſands of giant growth are every winter overthrown by the ſtorms, and allowed to periſh where they fall from the impoſſibility of tranſporting them to the ſea, others, in more acceſſible ſituations, are converted to various human uſes; the wood from its lightneſs and ſtraightneſs is excellent for maſts and yards, and various domeſtic purpoſes; the juice, as tar, turpentine, and pitch, is almoſt of equal value with the wood; and the inner bark, mixed with rye-meal, furniſhes a coarſe bread in times of ſcarcity. The *bird cherry*; the *white beam*; the *mountain aſh*; the *alder*; the *birch*; and *dwarf birch*; ſeveral kinds of *willow*; and the *aſpen*, are found in the whole peninſula; the lime, the elm, the aſh, and the oak, though growing with freedom in the ſouthern parts, are incapable of withſtanding the rigours of a Lapland winter. Among the larger ſhrubs the *German tamariſk*, the *guelder roſe*, and the *barberry*, are met with chiefly in the ſouth; the *burnet roſe*, the *gale*, the *raſpberry*, and *juniper*, are hardy enough to flouriſh even within the Arctic circle. The lower woods and thickets afford the *Linnæa borealis*, and *Trientalis Europæa*, in great abundance, and here and there are found the *everlaſting pea*, the *narrow-leaved willow herb*, the *mezereon*, the *hepatica*, and the *cornus Suecica*. The fir woods yield two ſpecies of pyrola, the *rotundifolia*, and *minor*; and the ſhady ſides of mountains and alpine lakes are adorned by the *ceraſtium alpinum*, *ſerratula alpina*, *tuſſilago frigida*, and the ſplendid *pedicularis ſceptrum*.

The dry rough tracts on the ſides of the mountains are covered with the *common* and *fine-leaved heath*; the *bearberry*, diſtinguiſhed by its ſcarlet cluſters; the *Iceland* and *rein-deer lichen*, the one an article of food to the inhabitants, the other the chief ſupport of the animal whoſe name it bears; *dryas octopetala*, mountain avens, *vaccinium vitis-idæa*, *rubus*

rubus ſaxatilis, *rhodiola roſea*, and *ſaxifraga cotyledon*, pyramidal ſaxifrage. The bleak ſummits where even the heath cannot root itſelf are clothed with the beautiful *azalea procumbens*, *androſace ſeptentrionalis*, *andromeda hypnoides*, and *ranunculus glacialis*; with the *arbutus alpina*, and *ſaxifraga nivalis*. The mountain paſtures conſiſt for the moſt part of the viviparous graſſes, mixed with *phaca alpina*, *aſtragalus alpinus*, *arnica montana*, *gentiana purpurea*, and *nivalis*, *alchemilla alpina*, *veronica alpina*, and *polygonum viviparum*. Botany.

The moiſt ſpungy alpine rocks, and the ſides of the torrents afford the *cloudberry*, one of the moſt plentiful and grateful of the Scandinavian fruits; ſeveral kinds of ſaxifrage, and dwarf willows. The wet and boggy paſtures yield, for the moſt part, a coarſe graſs mixed with *cotton ruſh*, with *narthecium oſſifragum*, *pedicularis flammea*, *ſaxifraga hirculus*, and cranberry, the fruit of which grows to a larger ſize than that of the ſame ſpecies in the Engliſh moſſes.

The plants which grow in the lakes and pools, covered as they are with ice nearly half the year, are not very numerous; the moſt important are the *white* and *yellow water-lily*, *calla paluſtris*, *lobelia dortmanna*, *menyanthes trifoliata*, and *nymphoides*, buck-bean, and fringed water-

The plants of Lapland may be divided into thoſe which are common to this and to more ſouthern countries, and thoſe which are ſcarcely ever met with beyond the limits of the Arctic circle. Among the former may be particularized *azalea procumbens*, *ſaxifraga cernua*, and *rhodiola roſea*, all growing in immenſe abundance on the higheſt mountains; *red currant*, *whortleberry*, *cloudberry*, *ſtone bramble*, the berries of all which are gathered in great quantities and preſerved under the ſnow till winter, at which time, mixed with rein deer's milk, they form an agreeable variety in the food of the inhabitants: the moiſt woods are perfumed during the ſhort ſummer by the *lily of the valley*, and *ledum paluſtre*.

The vegetables peculiar to Lapland, and which grow either on the higheſt mountains or on the ſhore of the northern ocean, are *diapenſia lapponica*, *andromeda cærulea* and *tetragona*, *rubus arcticus*, *ranunculus lapponicus* and *hyperboreus*, *pedicularis lapponica*, *gnaphalium alpinum*,

Botany. *ſalix lapponum*, *orchis hyperborea*, *pinguicula alpina*, and *azalea lapponica*.

Zoology. The Swediſh horſes are commonly ſmall but ſpirited; and are preſerved, by lying without litter, from ſome of the numerous diſeaſes to which this noble animal is ſubject. The cattle and ſheep do not ſeem to preſent any thing remarkable. Among the wild animals may be named the bear, the lynx, the wolf, the beaver, the otter, the glutton, the flying ſquirrel, &c. The rein deer of Lapland is briefly deſcribed in the account of the Daniſh monarchy. Sweden alſo preſents one or two ſingular kinds of falcons, and an infinite variety of game; among which may be named the kader, or chader, in Scotland called the cock of the foreſt, being as large as a common turkey, and of a black colour, while the hen is orange, and far inferior in ſize. The ora is rather larger than our black game. The hierpe is eſteemed the moſt delicate, about the ſize of a young pigeon, diverſified with black, grey, and white. The ſnoripa makes an extraordinary noiſe, particularly in the night.[9] The rana bombina, and the coluber cherſea, are conſidered as almoſt peculiar to Sweden.

Mineralogy. Of modern mineralogy Sweden may perhaps be pronounced the parent country; and her authors, Wallerius, Cronſtedt, and Bergman, (not to mention the great Linnæus, who confeſſes that he had no predilection for this ſtudy, perhaps becauſe it was undeterminable by forms, and members, upon which his zoology and botany reſt,) have laid the firſt ſolid foundations of the ſcience. It would therefore be a kind of literary ingratitude not to beſtow due attention on Swediſh mineralogy.

Gold. Firſt in dignity, though not in profit, are the gold mines of Adelfors in the province of Smoland. The rock is chiefly a flaty hornblend, in vertical banks, black, deep brown, red, or greeniſh, ſometimes ſoft like lapis ollaris, ſometimes very hard. The veins are generally of quartz, of a dark colour; the direction of the moſt productive being from N. to S. varying in thickneſs from two inches to near a fathom.[10] The gold is ſometimes native; and ſometimes com-

[9] Conſett, p. 71, &c. The *motacilla Suecica* is a beautiſul bird, which is ſaid to exceed even the nightingale in ſong; it is of a ſky blue colour, with two lines about the throat, one black, and the other of a ruſty hue.

[10] Bergman Phy. Geog. ut ſupra, p. 49.

bined

bined with ſulphur. Some ores of copper are alſo found in the vein, which likewiſe preſents white calcareous ſpar, red zeolites, ſmall red or green fragments of petroſilex, with galena and iron. But theſe mines ſeem to be nearly exhauſted.* In the production of ſilver Sweden yields greatly to Norway; yet the mine of Sala, or Salberg, about 30 Britiſh miles weſt of Upſal, maintains ſome reputation. It is ſituated in a country rather flat; and towards Norberg the region of the mines is divided, from a maſs of petroſilex, by fiſſures filled with earth, and little fragments of ſteatite. The ſilver is in limeſtone; which, however, when it is large grained and free from mixture, contains no mineral, and is ſtyled ignoble rock: it is on the contrary metallifero when fine grained, and mingled with mica.[11] There are about 100 veins, greater or ſmaller; and the gangart † is of ſteatite, talc, amianthus, aſbeſtos, hornblend, calcareous ſpar, and ſometimes quartz and beautiful petroſilex. The ſilver is rarely found native, but is procured from the galena or lead ore. Silver has alſo been found in Swediſh Lapland.

Mineralogy.

Silver.

The chief copper mines of Sweden are in the province of Dalecarlia. On the eaſt of the town of Falun is a great copper mine, ſuppoſed to have been worked for near 1000 years.[12] The metal is not found in veins, but in large maſſes; and the mouth of the mine preſents an immenſe chaſm, nearly three quarters of an Engliſh mile in circumference, the perpendicular depth being about 1020 feet. About 1200 miners are employed. Copper is alſo worked in Jemtland; and

Copper.

* Gold is alſo found in hornblend, at Baſna near Ryddarhytte. Bergman Phy. Geog. 24.

[11] Bergman Phy. Geog. ut ſupra, p. 53.

† This word, adopted from the German, ſignifies what was formerly ſtyled the matrix, a term abandoned, becauſe it implied that the mineral was produced by the ſubſtance in which it was found.

Our mineralogic terms are not yet ſtrictly preciſe. Veins of metal are commonly accompanied or incorporated with quartz, and various other ſubſtances, called the *gangart*. They are alſo often divided from the rock itſelf by thin layers called the *ſalbands*. In an accurate deſcription of a mine therefore, it is neceſſary to diſtinguiſh with preciſion the *rock* of the mountain, the *ſalbands*, and the *gangart*, which may all be very different ſubſtances.

The gold of Adelſors is ſometimes native, and ſometimes in the form of pyrites, with a gangart of quartz or hornblend. See Davila's Catalogue.

[12] Coxe, v. 94.

MINERALOGY. Iron.

at Ryddarhytte is found iron. Nor is Sweden deficient in lead: but iron forms the principal product, and the mine of Danamora is particularly celebrated for the superiority of the metal, which in England is called Oregrund iron, because it is exported from Oregrund an adjacent port, where the Bothnic gulph joins the Baltic. The mines of Danamora have no galleries, but are worked in the open air by means of deep excavations.[13] The ore is in a limestone rock, and occupies about 300 persons in twelve pits. This valuable mine was discovered in 1488. Bergman describes the iron mine of Taberg, in Smoland, as consisting of beds of ore, of a blackish brown, separated by beds of mould without any stone.[14] This enormous mineral pile is rivalled by an entire mountain of iron ore near Tornea, in Bothnia; and at Lulco the mountain of Gellivar forms a mass of rich iron ore, of a blackish blue, extending, like an irregular vein, for more than a mile, and in thickness from 300 to 400 fathom.* Cobalt is found at Basna, and zinc at Danamora; while the mines of Sala present native

[13] Coxe, v. 103. According to Jars, i. 120. the rocks of Danamora are granite, in which is found a kind of petrosilex, veined with different colours, probably a felsite, or compact felspar. The mineral however does not touch the granite, but is contained in a bluish rock, as most of the other minerals of Sweden. He informs us, vol. ii. that the mine of Adelfors was discovered in 1737. The native gold is in quartz, hornstone, or rather hornblend, and limestone. That of Fahlund in gneiss, Jars, iii. 34, which often passes to *hornberg*, or a tortuous and confused micaceous schistus.

[14] Bergman ut supra, p 58.

* In another passage, p. 23, Bergman observes that the two mountains of Kerunawara, and Lousowara, in Pitea Lapland, only divided by a little valley, are wholly composed of iron ore.

In the *Voyage de deux François*, by M. Fortia, Paris, 1796, five volumes, 8vo. the account of Sweden, which forms the second volume, is excellent. He informs us, p. 31. that the copper mines of Ridaor Hyttan, in Westmanland, near Alboga, also present iron, galena, bismuth, with petrosilex, red stalstein, fluor, and lapis olaris. The iron mines of Taberg present amianthus mixed with iron, pyrites, and mica. Salberg yields silver, galena, antimony, and the noted petrosilex of Wallerius, which is compact felspar, sometimes with nodules of actinote. Norberg presents iron in quartz, with red felspar in hexagon layers, sprinkled with quartz. Danamora, amidst abundance of iron, presents also amianthus, mountain cork, calcareous spar, amethyst, smoky crystal, garnet rock, mineral pitch, and martial pyrites, with petrosilex of several colours, sometimes in bands. This last is the *saxum Danemorense* of some mineralogists.

The noted quarries of porphyry were first worked in 1786. The stone is black grey, red, or brown; and spots white, red, or green. They are at Elfdal near Mora.

The same author informs us, v. 12, that the best iron mines of Russia are at Dougna, not far from Smolensk.

antimony;

antimony; and molybdena appears at Norberg. Coal has been recently discovered in the province of Scone. Mineralogy.

Sweden abounds with beautiful granite; but in marble yields to Norway. Porphyry also appears in the mountain of Swucku, and many other parts. At present, when precious stones are radically distinguished from coloured crystals, it would perhaps be difficult to discover any of the former in Sweden. Bergman celebrates the rock crystals of Offerdals in Jemtland, found in cavities of white quartz, which runs in veins through a rock of lapis ollaris;[15] but he passes in silence any other Swedish production of this kind, nor does the industrious Wallerius supply this defect, and he only adds coarse garnets of various colours.*

The most renowned mineral waters in Sweden are those of Medewi in eastern Gothland. Mineral Waters.

Sweden and Swedish Lapland abound with natural curiosities, of various descriptions. Some of the lakes and cataracts have been already mentioned; and it would be vain to attempt to describe the many singular and sublime scenes, which occur in so variegated and extensive a country. Natural Curiosities.

REMOTE AND DISTINCT PROVINCES.

In some instances a province or provinces belonging to a country are so distant, that they cannot be well included in the general account, Pomerania.

[15] Journal des Mines, ib. 35.

* The stone called *rapakivi* is from Rapakivi, two miles to the north of Uleaborg. It is of felspar and mica, of a brown colour, and apt to moulder.

The *binda* of the Swedes is a mixture of quartz and hornblend, or hornblend and felspar; the *grunbinda* consists of green hornblend with mica. The *grunstein* of the Swedes, which is a kind of *binda*, is a shivery and soft mixture of quartz, mica, and hornblend. Gallitzin *Recueil des Noms*, &c. Brunswick, 1801, 4to.

The *hornberg* of Cronstedt, and other Swedish mineralogists, is an irregular, knotty, and hard kind of micaceous schistus. See the observations of Andrada on the mines of Sala, in the *Journal des Mines*, No. 88. The mines of Sala contain iron, lead, silver, antimony, &c. with asbestos, quartz, garnets, &c. disposed in beds of primitive limestone, while the surrounding mountains are granitic.

but

but muſt, like the iſlands, be conſidered apart. In this caſe is Swediſh Pomerania, which contains about 103,000 inhabitants. Concerning this ancient duchy, of which Sweden only poſſeſſes a portion, Buſching has given ample details *. The kings of Sweden and Pruſſia have each a vote in the diets of the empire, the firſt as duke of Hither Pomerania, and the other of Further Pomerania. The ancient line of dukes having become extinct, Sweden received, by the celebrated treaty of Weſtphalia, great poſſeſſions in Pomerania; but was obliged, by the peace of Stockholm, 1720, to reſign a conſiderable portion to the king of Pruſſia; nor was the imperial inveſtiture obtained by Sweden for the remainder till 1754. The governor of Swediſh Pomerania reſides at Stralſund, where there is a court of juſtice for military affairs. There is alſo a royal court of juſtice at Griefswald; but the ſupreme tribunal is at Wiſmar. The revenues of Swediſh Pomerania ſcarcely exceed 140,000 rix dollars, and are incumbered with a public debt. The iſle of Rugen belongs to Swediſh Pomerania, and has the title of principality. This iſle is very productive in various kinds of grain, which are tranſported to Stralſund; the nobility are numerous, and as jealous of their privileges as if they moved in a wider ſphere. Rugen is divided into ſeven pariſhes, the chief town being Bergen. Stralſund, the chief town of Swediſh Pomerania, is ſurrounded with water on all ſides, and maintains a conſiderable trade. Griefswald is the ſeat of an univerſity founded in 1456.

Rugen.

SWEDISH ISLANDS.

Swedish Isles. Bornholm.

SWEDEN poſſeſſes many iſlands, ſcattered in the Baltic ſea and gulph of Bothnia. Next to Rugen, already mentioned, on the N. E. is the iſle of Bornholm, an ancient appanage of Denmark yielded to Sweden in 1658, but ſoon after reſtored to Denmark by the wiſh of the inhabitants, though it be often erroneouſly deſcribed in the maps as belonging to Sweden. Further to the north is the long iſland of Oland, or Œland, in length about ſeventy miles, in breadth about ſix. In the north are many fine foreſts,

Œland.

* Vol. x. p. 86. Fr. Ed.

white

while the ſouthern part is more level and fertile. The horſes are ſmall but ſtrong, and the foreſts abound with deer, nor is the wild boar unknown. Freeſtone, alum, and touchſtone are products of Œland; and the inhabitants are computed at near 8000. Next occurs the iſland of Gothland, known to the literary world by the travels of Linnæus, about ſeventy miles in length, and twenty-four in breadth; a fertile diſtrict remarkable for an excellent breed of ſheep. It was ſubject to the Danes for near near two centuries, till 1645, when it was reſtored to Sweden. The iſles of Aland mark the entrance of the Bothnic gulph, deriving their name from the largeſt, which is about forty miles in length, and fifteen in breadth, containing about 9000 inhabitants, who ſpeak the Swediſh language, though included in the government of Finland. Theſe iſles form as it were a barrier of rocks of red granite, ſtretching to the oppoſite ſhores.

Swedish Isles.

Gothland.

PORTUGAL.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progressive Geography.—Historical Epochs and Antiquities.

NAMES. THE name of Portugal is of recent origin. In the Roman period there was a town called *Calle*, now Oporto, near the mouth of the river Douro, and this haven being eminently distinguished, the barbarism of the middle ages conferred on the circumjacent region the name *Porto Calle*; which, as the country was gradually recovered from the Moors, was yet more improperly extended to the whole kingdom.[1] The ancient name of this country was Lusitania; but the boundaries do not exactly correspond.

Extent. Portugal extends about 360 British miles in length, by 120 in breadth; and is supposed to contain about 27,280 square miles, which with a population of 1,838,879, will yield 67 inhabitants to the mile square.[2] The extent and population thus approach nearly to those of Scotland: but by some accounts the population of Portugal may exceed the calculation here followed by nearly half a million.

[1] D'Anville Etats formés en Europe, &c. p. 192. [2] Boetticher's Tables, p. 46. Concerning this country, the author was favoured with some manuscript observations by a Portuguese eminently skilled in the statistics of his country, and which shall be inserted in the notes. It is computed that Portugal contains 2,740 Portuguese leagues, of 17 to the degree.

The

The original population of Portugal may be traced in that of Spain, and has undergone the ſame revolutions. Thoſe who are deſirous to enquire further into the ſubject may conſult the learned work of the Portugueſe antiquary.[3] ORIGINAL POPULATION.

The progreſſive geography of Portugal is alſo included in that of Spain, till the eleventh century, when it began to form a ſeparate ſtate. The kings of Caſtille had recovered a ſmall part of this country from the Moors about the year 1050: and the conqueſt was gradually extended from the north till about the middle of the thirteenth century, when the acquiſition of Algarve completed the preſent boundaries of Portugal. Progreſſive Geography.

The hiſtorical epochs of ſo recent a ſtate cannot be numerous; nor is it neceſſary to recur to thoſe ancient events, which more properly belong to the general hiſtory of Spain. Hiſtorical Epochs.

1. The kings of Aſturias ſubdue ſome of the Mooriſh chiefs of the north of Portugal; and Alphonſo the great eſtabliſhes epiſcopal ſees in the part between the Minho and Douro. In 1054 Ferdinand king of Caſtille extends his conqueſt to Coimbra; and on ſharing his dominions among his ſons, Don Garcia, along with Galicia, had a part of Portugal, whence he is ſtyled on his tomb, A. D. 1090, *Rex Portugalliæ et Galleciæ*.[4]

2. Alphonſo VI, brother of Garcia, and king of Caſtille, having favourably admitted ſeveral French princes to his court, among them was Henry, whom he nominated count of Portugal, adding his natural daughter Thereſa in marriage. The moſt exact French writers aſſert, from the chronicle of Fleuri, that this Henry was the grandſon of Robert duke of Burgundy, ſon of Robert king of France; and deſerve more credit than the Spaniſh, who derive him from the houſe of Lorrain, through a relation of Godfrey of Boulogne, the hero of Jeruſalem; a manifeſt error, as Godfrey of Boulogne, though he held the duchy of Lorrain, was not of the houſe of Lorrain. However this be, Henry appears as Count of Portugal in 1094 or 1095: ſignalized himſelf by many victories over the Moors, and died in 1112, leaving

[3] Reſendii Antiquitates Luſitaniæ. Col. Agrip. 1600, 12mo. [4] D'Anville, 194.

Historical Epochs.

a ſon Alphonſo the firſt. In the year 1139 Alphonſo gains an illuſtrious victory over five Mooriſh princes, and is acclaimed king by his troops upon the field of battle. In 1148 he ſeizes Liſbon by the aſſiſtance of a fleet of Cruzaders going to the Holy Land. Alphonſo died in the year 1185, aged upwards of ninety. Such are the foundations of the Portugueſe monarchy.

3. Alphonſo III, about the year 1254, completes the conqueſt of Algarve. Portugal continued to be fortunate in a ſucceſſion of great princes; but the wars againſt the Moors were unhappily followed by thoſe againſt the kings of Caſtille, which have implanted ſuch a deep hatred between the nations.

4. Portugal was to attract the admiration of Europe by her commercial diſcoveries. In 1415 John the great, king of Portugal, carrying his arms into Africa, and taking the city of Ceuta, an impulſe was given to the national ſpirit; and in 1420 we find the Portugueſe in poſſeſſion of Madeira. Emulation alſo contributed, for in 1402 Jean de Bethencourt, chamberlain of Charles VI of France, had taken poſſeſſion of the Canaries, and afterwards aſſumed the title of king of thoſe iſlands.[5] The Portugueſe diſcoveries in Africa proceeded under John's ſucceſſors, Edward, and Alphonſo V, and the auſpices of Prince Henry, till, in the reign of John II, they extended to the cape of Good Hope: and in that of Emanuel, Vaſco de Gama opened the Eaſt Indies.

5. John III admits the inquiſition, A. D. 1526; ſince which event the Portugueſe monarchy has rapidly declined.

6. Sebaſtian king of Portugal leads a powerful army on an idle expedition into Africa, and is ſlain in battle. He is ſucceeded by his uncle Cardinal Henry; who dying two years afterwards, Portugal was ſeized by Philip II king of Spain, 1580.

7. The revolution of 1640, which placed the houſe of Braganza on the throne of Portugal. John IV was a deſcendant of the ancient royal family, by the female line. Little of conſequence has ſince ariſen, except the earthquake at Liſbon in 1755, the celebrated adminiſtration of Pombal, and the recent intermarriages with Spain, which promiſe, at

[5] See the hiſtory written at the time by his Chaplains, publiſhed at Paris 1630, 8vo.

no

no remote period, to unite the kingdoms. The recent peace with Spain seems to have been procured by humiliating concessions. HISTORICAL EVENTS.

The antiquities of Portugal consist chiefly of Roman monuments, with a few Moorish remains. In the furthest north is an extensive series of arches, formerly a Roman aqueduct.[6] At Evora are well preserved ruins of a temple of Diana, and an aqueduct ascribed to the celebrated Quintus Sertorius, whose life is delineated by Plutarch.* Among the antiquities of the middle ages may be named the noble monastery of Batalha, in Portuguese Estremadura, about 60 miles to the north of Lisbon, founded by John I, at the close of the fourteenth century, in consequence of the great victory over the king of Castille, one of the most noble monuments of what is called the Gothic style of architecture.[7] Antiquities.

[6] Murphy's Travels.

* At Chaves is a Roman bridge, erected in the time of Trajan and still entire.

[7] See the minute description by Murphy.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government.—Laws.—Population.—Colonies.—Army.—Navy.—Revenues.—Political Importance and Relations.

RELIGION. THE religion of Portugal is the Roman Catholic; and a strict observance of its duties forms one of the national characteristics, the men vying with the women in attention to their repeated daily devotions. There are two archbishoprics, and ten episcopal sees: and there is besides a patriarch, but he does not seem to possess extraordinary powers. The number of parishes approaches four thousand;[1] while in Scotland, a country of similar extent, they do not reach one thousand: but the catholic religion affords supplies for a far greater number of priests, than the protestant.

Government. The constitution of Portugal is a monarchy, absolute and hereditary; yet in case of the king's demise without male issue, he is succeeded by his next brother, whose sons have however no right to the throne till confirmed by the states.[2] The chief articles of the constitution are contained

Laws.

[1] Murphy's State of Portugal, p. 10.

The title of patriarch of Lisbon is only given by brevet to the archbishop of Lisbon, and he has no special jurisdiction. The inquisition still struggles for power, and takes every advantage for its own profit; nor is there much hope of a change. The church at present contains two archbishoprics in Europe, and three in the colonies; fourteen bishoprics in Europe, and sixteen in the colonies. The convents of men in Europe are 417, and of women about 150. The secular clergy about 22,000, monks 14,000, nuns 10,000, all in Europe. The papal jurisdiction has been somewhat diminished since 1770, but the influence is still very great. MS. Notes.

[2] Ib. 109, from the Portuguese writers.

The prince of Brazil was appointed regent by his mother, the heiress of the kingdom. Don Pedro, his father, was king as husband of Maria, or according to the Scotish expression, had the crown matrimonial, but was not regarded as sovereign. MS. Notes.

The administration lies with four ministers and secretaries of state; one is president of the treasury, or at the head of the finances; another minister of the interior; another of war, and foreign affairs;

tained in the ſtatutes of Lamego, iſſued by Alphonſo I in 1145. The king's titles are numerous: that of the heir apparent is prince of Brazil; his eldeſt ſon prince of Beira. The laws have few particularities: they are lenient in caſes of theft, which muſt be repeated four times before death be the puniſhment. An adultereſs is condemned to the flames: but this, like other laws too ſevere for the offence, is never put in execution.* Laws.

Portugal is divided into ſix provinces. 1. Entre Douro e Minho. 2. Tras-os-Montes. 3. Beira. 4. Eſtremadura. 5. Alentejo. 6. Algarve. The two firſt being on the north of the kingdom the next two in the middle, the two laſt in the ſouth. The firſt province derives its name from its ſituation, between the rivers Douro and Minho, and is very populous and fertile. The ſecond is mountainous, as the name imports; but there are vales which contain vineyards, and other cultivated lands. Beira is a large and fertile province; and is rivalled in ſoil by Eſtremadura, which, like the Spaniſh province of the ſame name, is ſaid to derive its etymon from having been extreme frontiers towards the Moors in the ſouth. Alentejo having been moſt expoſed to the attacks of the Spaniards, is defective in population. Algarve is a very ſmall diviſion, which has however the honour of forming an addition to the royal titles, as Navarre to that of France; thoſe minute provinces having been comparatively recent acquiſitions. The popu- Population.

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fairs; the fourth of the marine and the colonies. In 1796 a council of ſtate was nominated by the prince, conſiſting of thirteen members, including the four miniſters, but it is only aſſembled on ſolemn occaſions. The chancellor is a ſubordinate officer, and does not adminiſter juſtice. The chief of the court, called Relaçõ, ſomewhat reſembling the parliament of Paris, is called Regent of the Juſtices, but the other high courts do not depend on him. There are five royal councils which judge without appeal; two for Europe at Liſbon and Oporto; two for Brazil at Bahia and Rio Janeiro; one for Aſia at Goa. By an edict of the 4th Auguſt 1769, no law has poſitive authority, except the ordinances of the kings; but the Roman law may be conſulted as *written equity*. MS. Notes.

* The councils are, 1, that of the palace, which is ſupreme in juſtice, and has all the powers of a lord chancellor: 2, that of the inquiſition, which was declared *royal* by king Joſeph, while before it was only *papal*; it has four inferior chambers at Liſbon, Evora, Coimbra, and Goa: 3, that of the finances: 4, that of the colonies: 5, that of honour, or the affairs of knights: 6, that of war: 7, the admiralty. There are five ſovereign courts of juſtice, *Relaçoens*, at Liſbon, Porto, Bahia, Rio Janeiro, Goa. MS. Notes.

Population. lation of the whole is, according to Boetticher, 1,838,879; but by Murphy's ſtatement 2,588,470. As this laſt is derived from Portugueſe authors, who have little ſkill in ſtatiſtics, it ſeems to be exaggerated as uſual in ſuch caſes.*

Colonies. The chief colony from Portugal is that eſtabliſhed in Braſil; and they ſtill retain many ſettlements on the coaſt of Africa, with Goa and Macao in the Eaſt Indies, the relics of great power and territory.

Army. The army is only computed at about 24,000; and the militia might

Navy. perhaps amount to as great a number. The naval power, once conſiderable, is reduced to thirteen ſail of the line, and fifteen frigates.[3]

* The cities of Portugal are computed at 23, but ſome are very ſmall; the villas or municipalities are 350; the villages are very numerous, and the pariſhes not leſs than 4262.

The ſtate of Population given by Buſching is drawn from fragments of an eſtimate made eighty years ago by the marquis d'Abrantes. Here is the ſtate drawn up by the relearches of the magiſtrates, and publiſhed in 1802.

	Pariſhes.	Hearths.
Entre Douro e Minho	1327	181,593
Tras os Montes	711	77,054
Beira	1292	224,649
Eſtremadura	420	120,333
Alentejo	369	76,246
Algarve	71	25,523
Liſbon and the *banlieue*	72	54,954
	4262	760,402

It is ſuppoſed that ten fires give thirty-eight perſons, becauſe many live ſolitary, who in other countries are with their relations or friends; but in Liſbon five perſons may be allotted to each hearth, becauſe more people live together, and there are more domeſtics. But when the total population is computed at 2,900,000, there ſeems to be ſome exaggeration. MS. Notes.

[3] Murphy, 119.

Since the year 1763, the ſoldiers have been well paid. At preſent there are twenty-eight regiments of infantry, twelve of cavalry, five of artillery, one of light troops, all ſtrengthened according to circumſtances. In 1798 there were forty-three regiments of regular militia, diſtributed as follows:

Entre Douro e Minho	8
Government of Oporto	4
Tras os Montes	5
Beira	7
Eſtremadura	8
Alentejo	8
Algarve	3.

The military governments are ſeven; the ſix provinces, and the government of Oporto, compoſed of a part of Beira, and a part of Entre Douro e Mino. MS. Notes,

The

The revenue is calculated at 2.000,000l. sterling, and the gold of Brazil mostly passes to England in return for articles of industry.* REVENUES.

Portugal retains small influence in the political scale of Europe. Her commerce is almost wholly dependent on England; but by land she is exposed to no danger except from Spain, or by the consent of Spain. The union of the two countries would doubtless be advantageous to both; but might prove detrimental to English commerce, and the weight of England in the Portuguese councils would infallibly subside. Political Importance and Relations.

* According to the MS. Notes, the revenue may be computed at more than 70,000,000, and the national debt about 100,000,000 of French livres.

CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Cuſtoms. — Language. — Literature. — Education. — Univerſities. — Cities and Towns. — Edifices. — Roads. — Inland Navigation. — Manufactures and Commerce.

MANNERS AND CUSTOMS.

THE manners and cuſtoms of the Portugueſe are diſcriminated into thoſe of the northern and ſouthern provinces, the former being more induſtrious and ſincere, the latter more polite and indolent. In general the Portugueſe are an elegant race, with regular features, embrowned by the ſun, and dark expreſſive eyes. The prejudices of nobility are as common and pernicious in Portugal as in Spain; nor is that general intercourſe found which imparts knowledge and vigour to ſociety. All ranks ſeem fond of retirement and ſilence, and little inclined to ſocial pleaſures. Yet they are friendly to ſtrangers, eſpecially if catholics. The women are commonly of ſmall ſtature, yet graceful and beautiful. Like other ſouthern nations, the Portugueſe eſteem a plump roundneſs of the limbs; nor is the green, or rather ſea-green, eye ſo much applauded by the European poets of the middle ages, without its ſhare of modern admiration.[1] Ladies of rank ſtill imitate the induſtry of their anceſtors in ſpinning flax from the diſtaff: and the oriental manner of ſitting on cuſhions on the floor is often practiſed. The dreſs reſembles the Spaniſh, but the men prefer the French, with the exception of a large looſe cloak. The peaſantry remain miſerable vaſſals of the Fidalgos, or gentlemen.*

[1] Murphy, 139. The French poets are full of yeux verds. Drummond of Hawthornden (Letters, p. 252.) praiſes the green eye; which is ſtill found even in the Orkneys, as appears from the Tranſactions of the Scotiſh Antiquaries, vol. i.

Link remarks, 210, that the round noſes and thick lips of the Portugueſe contraſt with the Spaniards.

* There are no longer any duennas, and huſbands are not more jealous than elſewhere. The peaſants live on ſalted fiſh and vegetables. MS. Notes.

In diet the Portuguese are temperate, or rather abstemious; and the beauty of the climate induces them to spend most of their time in the open air, a house being little more than a conveniency to sleep in. Manners and Customs.

The games are billiards, cards, and dice. The common people fence with a quarter staff; but the chief amusement consists in the bull fights, already described in the account of Spain. The arts and sciences are almost entirely neglected, except by a few among the clergy.*

The Portuguese language is more remote from that of Castille than might be expected from the circumstances. As the royal race was of French extract, it is supposed that many of the words are derived from the Limosin and other dialects of the south of France. It is a grave and solemn speech; but would have been little known among foreigners, had it not been diffused by the fame of the Lusiad. Language.

The literature of Portugal may be said to commence with Deniz, the sixth sovereign, who cultivated poetry and the belles lettres, and founded the university of Coimbra. In his reign lived Vasco Lobeira, who is said to have been the original author of that famous romance Amadis de Gaula. In more recent times, Saà do Miranda has acquired reputation in pastoral poetry. The chief historians are Joaõ de Barros, Fr. Luis de Sousa, Fr. Bernardo de Brito Vieira, Osorio bishop of Sylves, Duarte Ribeiro de Macedo, the venerable Bartholomeo do Quartal, and the count de Ericeira.[a] Among the poets are celebrated Camoens, Digo Bernardes, Antonio Barboza, Bacelar, and Gabriel Pereira: two dramatic writers are also mentioned, Vicente Antonio Josephar, whose plays are published in four volumes; and Nicola Luis, called the Portuguese Plautus. In mathematics Pedro Nunez distinguished himself at the beginning of the sixteenth century. Of late years natural history begins to be a little studied: but Portugal is the last of nations in that department.† Literature.

* Link observes, p. 87, that neither fine paintings nor taste are to be found in Portugal.

[a] Murphy, 157.

† Yet Camara, D'Andrada, and Fragoso, are not unknown in mineralogy.

The royal academy of Lisbon exists no more; and the university of Evora has remained suppressed since 1759. MS. notes.

Pombal introduced the sciences by force; and since his administration they have daily diminished. MS. notes.

EDUCATION. Universities.

Education seems greatly neglected in Portugal, though the university of Coimbra be of ancient date. Link computes the students at 800. That of Evora was founded in 1553; and a college at Mafra in 1772. The royal academy is of recent erection, and the design aspires to considerable public utility.

Cities and Towns. Lisbon.

Lisbon, the capital city of Portugal, was called by the ancients Ulyssippo, and the foundation fabulously ascribed to Ulysses. The situation is grand, on the north side of the mouth of the Tajo, and is sheltered on the N. W.[1] by a ridge of hills. The haven is capacious and excellent. This capital was regained from the Moors in the twelfth century, as already mentioned. The population is computed at about 200,000. The earthquake of 1755, a dreadful and memorable epoch among the inhabitants, has contributed to the improvement of the city, the new streets being broad and well paved, resembling those in the west end of London. For constant residence the ladies prefer the attic floors; and ventilation and coolness are chiefly consulted, grates being almost unknown; while in winter a warm cloak supplies the place of a fire.[1] There is no court end of the town; and the finest streets are inhabited by tradesmen. There are public walks, two theatres, and a circus for the bull feasts. The patriarchal church is singularly magnificent; and the revenue is computed at 114,000l. The English have an open burial ground, in which are deposited the remains of the celebrated Henry Fielding, an author unrivalled in the just delineation of life. The royal monastery of Belem, founded by king Emanuel in 1499, stands about five miles S. W. of Lisbon; and to the N. is a noble modern aqueduct completed in 1732. The consumption of butchers' meat at Lisbon in 1798 was, 27,985 oxen, 1,279 calves, 27,562 sheep, 11,927 hogs.

Oporto.

The next considerable town, especially in the eye of strangers, is that of Oporto, seated on the N. side of the river Douro, about five miles from the sea, upon the declivity of a hill, so that the houses rise like an amphitheatre. The streets are however narrow, and the houses ill constructed. Population about 30,000. The churches are of little note:

[1] Murphy's Travels in Portugal, 148. The northern branch of the Tajo at Lisbon is alone practicable for large vessels. MS. notes.

the

the British factory is a large and neat building. The chief exports are wine, oranges, lemons, &c., and linen cloth to the American colonies in Brazil. Cities and Towns.

Setuval, or St. Ubes, is a considerable town with about 12,000 inhabitants, and a prosperous commerce. Setuval.

Braga, though inland, is another considerable town: and in the second northern division are the towns of Miranda and Braganza, the last of which conferred the ducal title on the present reigning family. Braga.

In the province of Beira is the venerable city of Coimbra, with its ancient university. Alentejo contains the city of Ivora, rather of ancient fame than of modern consequence. Tavora, the principal town of Algarve, does not exceed 5000 inhabitants.

The chief edifices of Lisbon are the cathedral, and monasteries, formerly mentioned. The nobility, as in Spain, crowd to the capital, whence the country is little decorated with villas. In the mountains of Cintra, the furthest western extremity of Europe, about 20 miles W. of Lisbon, is placed a remarkable monastery, 3000 feet, as is said, above the sea, towards which there are remains of ancient buildings, and a curious bath replenished by a never failing spring. On the E. of the mountain is a summer palace of Moresque architecture. The environs are rich and delightful, supplying most of the fruits and greens used at Lisbon. Here is also a small vineyard, that of Carcavella, yielding a peculiar grape, which gives name to our Calcavella, a vine generally fabricated in London.[4] Edifices.

Portugal seems to have paid no attention whatever to the construction of canals; nor perhaps are they found indispensable in a country abounding with rivers, and bordered with an ample extent of sea coast. Inland Navigation.

The Portuguese manufactures are few and unimportant: hats and paper have been lately fabricated at Lisbon; but the chief manufactories are those of woollen cloth at Covilham, Portalegre, and Azeitaon. Manufactures and Commerce.

[4] Murphy's Travels in Portugal, 241, &c. The noble aqueduct of Alcantara near Lisbon was built of white marble in 1738, there are 35 arches, the highest 230 feet. Reichard, *Guide des Voyageurs*, Weimar 1805, 8vo. i. 12.

MANUFACTURES AND COMMERCE.

A considerable commercial intercourse subsists with England; but the balance in favour of the latter appears to be about 400,000l. sterling: and Ireland gains by her exports about 63,000l. annually.[1] The Falmouth packets bring frequent remittances of bullion, coin, diamonds, and other precious stones; and for a considerable time the Portuguese gold money was current in England. Besides woollens and hardware, England transmits to Portugal large cargoes of salted and dried fish, the last article to the annual amount of about 200,000l. The exports of Portugal are chiefly wine, oil, oranges, lemons, figs, sugar, cotton, cork, drugs, and tobacco. Portugal also maintains a considerable trade with her flourishing colony in Brazil, the inhabitants of which are computed at 900,000. The articles exported to America are chiefly woollens, linens, stuffs, gold and silver lace, fish dried in Portugal, hams, sausages, &c. with glass manufactured at Marinha. Brazil returns gold, silver, pearls, precious stones of various descriptions, rice, wheat, maiz, sugar, molasses, ornamental timber, and many other articles rather curious than important. The drugs, spices, and articles used in dying must not however be omitted. The trade with the East Indies is inconsiderable; and that with the other European nations scarcely deserving notice: it is chiefly with Holland, France, Denmark, and Germany. Some trade is also carried on with the American states.* Nor is the internal trade at the great fair of Viseu beneath notice.

[1] Murphy's State, 62.

* The entries at the port of Lisbon, during four years, were as follow:

1796	1519,	of which 483	English.
1798	1723	678	——
1799	1492	570	——
1801	1476	419	——

The grain was formerly furnished by England, when in possession of her North American colonies, but is now supplied by the American States, Barbary, and Prussian Poland. Much rice is consumed, being imported from Carolina. MS. notes.

The coin, which the English call joannes, is in the Portuguese *peça*; the English moidore is the *monduro*, or *moeda de ouro*, that is simply gold coin. MS. notes.

Brazil supplies about twenty-seven millions of francs yearly in gold, or little more than a million sterling; and since 1780 always more than a hundred millions of merchandise. MS. notes. As it is well known that a great part of the Portuguese gold comes from Sofala, it must be included under that of Brazil, if it be not remitted to India and China in order to purchase merchandise in those countries.

The colonies are Brazil, Mozambic, Melinda, Sofala, Cuama, Angola, Benguela, with the isles St. Thomé, del Principe, Cape Verd, Madeira, Azores. In India, Goa, Diu; and Macao in China. MS. notes.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

THE climate of Portugal is familiarly known to be most excellent and salutary. At Lisbon the days of fair weather are computed to amount to 200 in the year; and those of settled rain seldom exceed 80. The medial heat is generally about 60°.[1] CLIMATE AND SEASONS.

The face of the country is generally fertile, though with many acclivities; and in the N. E. corner there rises a considerable cluster of mountains, seemingly unconnected with the great Spanish chains. The numerous vineyards, and groves of orange and lemon trees, conspire with the crystal streams, and verdant vales, to impart great beauty and diversity to this favoured country. The soil, like that of Spain, is generally light; but the agriculture in rather a neglected state: and the farmers have a singular prejudice that soils of different qualities are equally adapted to any vegetables. The ground is rather scratched than ploughed, and is sown immediately; nor is the operation of the harrow much regarded. Meadows are little known, except in the N. W. province between the Douro and the Minho; and many fine vales remain in a state of nature. The streams having generally a considerable fall, and the rains being violent though rare, the crops are sometimes destroyed by the force of the torrents.* Face of the Country. Soil and Agriculture.

[1] Murphy's Trav. 220.

* Link observes, p. 163, that the numerous monasteries impede the progress of agriculture. By a singular mismanagement there are no cellars, and the wine is kept in warehouses. Ib. 374.

Rivers. The rivers of Portugal have been already enumerated in the description of Spain. The Tajo is here a noble ſtream, and its eſtuary near Liſbon affords a capacious haven, from two to nine miles in breadth. Among the native ſtreams may be named the Mondego which paſſes by Coimbra;* the Soro which runs into the Tajo; and the Cadaon which forms the harbour of Setuval. Scarcely a lake can be traced in the map of Portugal; but ſome ſmall pools have become remarkable from circumſtances, ſuch as the Eſcura ſituated on the ſummit of the mountain of Eſtrella in the province of Beira, and which is covered with ſnow during four or five months. This ſmall lake is noted for a profound vortex, by the Portugueſe writers, who are fond of fable, and little verſed in the philoſophy or hiſtory of nature. Another deep pool occurs near the village of Sapellos, which is ſaid to have been the ſhaft of a gold mine worked by the Romans. The lake of Obidos, in the Eſtremadura, is ſometimes open to the ſea, and at other times cloſed with ſand: it contains variety of excellent fiſh.

Lakes.

Eſcura.

Mountains. The mountains of this kingdom have not been exactly deſcribed. Thoſe in the N. E. ſeem an unconnected cluſter, as already mentioned: but the Spaniſh chain to the N. of Madrid, called by ſome the mountains of Idubeda, enters Portugal near the town of Guarda, and purſues its former courſe to the S. W. The chain of Arrabeda, in Eſtremadura, ſeems a branch or continuation of this: it is chiefly calcareous, and affords beautiful marble. The chain of Toledo appears, as not unuſual with the moſt extenſive ranges, to ſubſide before it enters Portugal. In the province of Alentejo is however a ſmall chain, ſeven leagues in length by two and a half in breadth, running between the city of Ivora and town of Eſtramas, which may be regarded as belonging to the chain of Toledo. Eſtrella, already mentioned, gives ſource to the Mondego, and two other rivers, and belongs to the firſt mentioned chain. Monte Junto, the ancient Sagrus, is in Eſtremadura: its verdure affords a rich paſturage, and the breed of horſes was formerly celebrated.†

Idubeda.

Arrabeda.

* Celebrated by Camoens in the ſtory of Inez de Caſtro:

Nos ſaudoſos campos de Mondego, &c.

† The deſcription of the mountains forms the beſt part of Link's work. He viſited the northern chain of Gerez, that of Maram, and that of Eſtrella. They are all granitic, and the ſummits about 6000 feet, while ſome of the Spaniſh may be 8000.

The zoology of Portugal may be regarded as the ſame with that of Spain.* The horſes are however much inferior, but the mules are hardy and ſtrong. The oxen are ſometimes equal in ſize to thoſe of Lincolnſhire; but even cows are rare, as the natural paſture is injured by the heat of the climate, and no attention is paid to artificial meadows.[2] The ſheep are alſo neglected, and far from numerous; but ſwine abound, and are fed with excellent acorns, ſo that the Portugueſe hams are deſervedly eſteemed. Zoology.

The mineralogy of Portugal has been almoſt as much neglected as the agriculture. In the two northern provinces are ſeen immenſe mines, ſuppoſed to have been worked by the Romans, being perhaps the mines in the N. of Luſitania mentioned by ancient authors.[3] The mouth of the largeſt, cut through the ſolid rock, is a mile and a half in circumference, and upwards of 500 feet deep; at the bottom it meaſures 2,400 feet by 1400. Many ſubterranean paſſages pierce the mountain like a labyrinth, and the whole works are on the grandeſt ſcale. Other ancient mines are alſo found in theſe provinces. Nor were theſe mines wholly neglected in the middle ages; for there is an ordinance of king Deniz, in favour of thoſe who were employed in the gold mines of Adiſſa near the mouth of the Tajo.[4] But as the operations were attended with great expence, they were abandoned ſoon after the diſcovery of the Cape of Good Hope, it being found more profitable to import the metals from India, and afterwards from Brazil. Small veins of gold have been obſerved in the mountains of Goes and Eſtrella; and it is ſtill found in the ſand of ſome ſtreams, as in ancient times the Tajo was celebrated for this metal. Under the domination of the Spaniards a mine of ſilver was worked, not far from Braganza, ſo late as the year 1628. Tin was alſo found in various parts of the northern provinces; and near Miranda there was formerly a royal manufactory of pewter. There are lead mines at Murſa, Lamego, and Cogo, and the galena ore is very productive of ſilver; copper is found near Elvis and in other diſtricts. The iron mines are neglected, from a deficiency of fuel; though coal be found in different parts of the kingdom, and that of Mineralogy.

* For the Botany ſee Spain.

[2] Ib. 25.

[3] Murphy's State, 42.

[4] Ib. 43.

Buarcos

MINERALOGY.

Buarcos ſupply the royal foundary at Liſbon. This bed of coal is about three feet ſix inches broad, and enlarges according to the depth. Emery is found near the Douro; and many beautiful marbles abound in this kingdom. The mountains of Goes, and others, produce fine granite: and talc occurs near Oporto. Amianthus is diſcovered in ſuch quantities, that it has been recommended to the artillery in the form of incombuſtible paper. The felſpar of Eſtrella, mingled with white clay, has been found to compoſe excellent porcelain. Fullers' earth occurs near Guimerans. Portugal alſo boaſts of antimony, manganeſe, biſmuth, and arſenic; and near Caſtello-Branco are mines of quickſilver. Rubies have been diſcovered in Algarve; jacints in the rivers Cavado and Bellas; beryl or aquamarine in the mountain of Eſtrella. In ſhort Portugal abounds with minerals of moſt deſcription; and nothing is wanting but fuel and induſtry.

Mineral Waters.

Nor is there any defect of mineral waters of various kinds. The baths of Caldas da Rainha, in Eſtremadura, are the moſt celebrated; and the next are thoſe of Chaves. Salt and petrifying ſprings alſo appear; and others to which the ignorance of the Portugueſe has aſcribed wonderful qualities, which are diſmiſſed from the modern ſchool of natural knowledge.

Natural Curioſities.

Many of theſe have been claſſed among the natural curioſities of the kingdom, as well as ſome of the lakes and mountains. On the north bank of the river Douro is a high maſſy cliff, with engraved letters or hieroglyphics, ſtained with vermillion and blue; beneath which is a grotto, ſuppoſed to abound with bitumen, which proved fatal to the pariſh prieſt in his attempt to explore it in 1687. Some petrifying caves, &c. will not now be admitted to the rank of natural curioſities. Striking and ſingular ſcenes of rock, water, and ever-green groves, abound in this beautiful country.

PORTUGUESE

PORTUGUESE ISLANDS.

The Azores properly belong to Europe, and not to Africa, under which laſt diviſion of the globe they have hitherto been claſſed. They are about thirteen degrees from Cape St. Vincent in Portugal, while the African ſhore is more diſtant by at leaſt one degree; and their latitude rather connects them with Europe than with Africa: not to mention that they were firſt peopled by Europeans, and that this portion of the globe is too ſmall to abandon any appendage.* Azores.

The general accounts bear that theſe iſlands were all ſucceſſively diſcovered by the Portugueſe, before 1449, who gave them the name of Azores from the number of goſhawks, which they here obſerved remarkably tame, their being neither man nor quadruped.. But there is ſome reaſon to believe that they were not unknown before, though, being left uninhabited, they attracted little attention. The map executed at Venice in 1367, by Fr. Picigano, and preſerved in the ducal cabinet at Parma, though it contain the Canary Iſlands, with their modern names, does not preſent the Azores; but that of Bianco, 1436, preſents even the moſt remote and detached of theſe iſlands Corvo and Florez. But ſuch monuments cannot always be depended on, as additions may have been made a century after their firſt conſtruction.

However this be, in 1466, the Portugueſe king gave them to his ſiſter the ducheſs of Burgundy; and they were in conſequence colonized by Flemings and Germans, among whom was Job de Huerter, father-in-law of the celebrated geographer Martin Behaim, who reſided in Fayal. The ſubſequent hiſtory is rather obſcure; but the Flemiſh inhabitants ſeem to have always acknowledged the king of Portugal.

The crown of Portugal having become united to that of Spain in 1580, the inhabitants of theſe remote iſlands appeared willing to reject the Spaniſh yoke, and to acknowledge Don Antonio as their ſovereign. The French in conſequence ſent a body of troops to Tercera,

* In ſome maps, ſee *Voyages au Nord*, a *ſhallow*, or deep ſhoal, runs from the Land's End in England to the Azores; but they rather ſeem a continuation of the Spaniſh mountains.

Isles. commanded by De Chaſte, in 1583, who were, however, defeated in a battle with the Spaniards.*

Theſe events ſeem to have excited the attention of the Engliſh during their warm competition with Spain; and, in 1589, the earl of Cumberland fitted out four ſhips at his own expence, with which he cruized off the Azores. The account of this expedition was drawn up by Edward Wright, an excellent mathematician who was preſent, and ſuppoſed to have been the firſt author of the celebrated invention for the conſtruction of charts, commonly called Mercator's projection, though it ſeem to have been known a century or two before, as it cannot be diſtinguiſhed from that of ſeveral maps and charts in which the degrees of longitude are careleſsly reduced to ſquares. It appears that the people of Florez ſtill acknowledged Don Antonio as their king, and ſupplied the Engliſh with proviſions. Some Spaniſh ſhips were taken; but the rich caracs had departed a week before their arrival. The town of Fayal was plundered.† In 1591, a glorious action was fought near the iſle of Florez, by ſir Richard Grenville, in the Revenge, againſt fifteen Spaniſh ſhips of war; and though his veſſel was reduced to a complete wreck, her gallant commander died on the ſecond day of his captivity, rather of vexation than of his wounds. The account of this action is written by the celebrated ſir Walter Raleigh. In the ſame year, 1591, captain Flicke commanded a cruizing voyage to the Azores, and has himſelf drawn up an account of the expedition. The intention was, as uſual, to watch for Spaniſh ſhips from the Weſt Indies. The Spaniards having probably altered their arrangements, this practice of cruizing off the Azores appears to have only continued for a few years; and the hiſtory of theſe intereſting iſlands relapſes into obſcurity.

A furious earthquake is ſaid to have been felt on the 9th July 1757.

The chief iſles are St. Michel, Tercera, Pico, or the Peak, and Fayal, with two ſmaller far in the weſt called Florez and Corvo. An excellent map was publiſhed at Paris, in 1791, from the obſervations of M. Fleurieu, and of Toſino the Spaniſh aſtronomer. St. Michel is repreſented as

* See Thevenot's Collection, vol. iv. for the voyage of De Chaſte. The celebrated Herrera alſo gave a ſeparate hiſtory of theſe tranſactions, Madrid 1591, 4to.

† See this voyage in Hakluyt, vol. ii. or in Aſtley's collection.

about

about forty British miles in length, by about twelve of medial breadth. Tercera is about twenty-five by fifteen. The Peak about thirty by ten; and is exceeded by St. George in length, but the breadth of the latter seldom exceeds five miles. The detached islands of Florez and Corvo are very small, especially the latter. ISLES.

The volcanic mountain, which gives name to the Peak, is by some reported to equal that of Teneriffe in height. M. Adanson, who visited these islands on his return from Senegal in 1753, says that the Peak is about half a league in perpendicular height; the common French league being 2450 toises, the height would on this supposition be very moderate, not exceeding 7350 feet. In the views which accompany the French map, the Peak rises from the sea in the shape of a bell. This island is said to produce excellent wine.

The Peak of the Azores would form a very convenient first meridian of longitude, instead of the various and confused distinctions recently adopted; and which seem rather to originate in national vanity, than in any just principles of the science, which they greatly tend to obscure. Itself a most remarkable object, and placed near the western extremity of Europe, no situation could be preferable for this important purpose, which would tend so much to throw a clear and universal light on geographical positions.

In general the Azores are mountainous, and exposed to earthquakes and violent winds; yet they produce wheat, wine, fruits, and abundance of wood. The chief is Tercera (whence they are sometimes styled Terceras), being 15 leagues in circumference. The capital town is Angra, on the S. E. side of Tercera, with a harbour defended by a fortress, in which resides the governor of the Azores. Angra is a bishopric, with some handsome churches, particularly that of the Cordeliers; and there are two other monasteries, and four nunneries.*

According

* Busching in his Geography, (iii. 590. Fr. tr.) has rightly placed the Azores after the description of Portugal; but he errs while he includes Madeira in the same description, not considering that the latter is far nearer to the coast of Africa than to that of Europe, and the general rule is to ascribe the isles to the nearest continent. Nor is his argument, that the Azores belong to Europe because the chief town Angra sends a deputy to the assembly of the states of Portugal, like the other towns of the kingdom, very cogent, as some of the Russian governments include portions of Asia and Europe.

Isles.

According to M. Adanſon, the harbour of Fayal preſents a beautiful amphitheatre, clothed with trees; the town has 5000 inhabitants, but may be ſaid to conſiſt of convents: the governor is ſtyled *Capitan mor*. The climate and ſoil are excellent, there being no occaſion for fire in the winter. The trees are walnuts, cheſnuts, white poplars, and particularly the arbutus or ſtrawberry tree, whence the name, for Fayal in the Portugueſe implies a ſtrawberry.* Cattle, &c. abound: yet almoſt the only birds are a kind of blackbirds, ſpeckled with white. Fayal is rather mountainous, and there is a volcano near the centre, but the laſt eruption was 1672. It is to be regretted that theſe intereſting iſles, like all other Portugueſe ſettlements, are almoſt unknown.†

The deſcription of Buſching is in his uſual prolix and feeble manner, he being a dry compiler incapable of ſeizing intereſting circumſtances, but ſome hints may be extracted.

The Azores have alſo been called the *Flamengas*, or Flemiſh Iſlands, having been colonized by that people. St. Michel, the moſt populous, is ſaid to contain 51,500 ſouls, beſides 1393 religious. The produce of wheat and millet is very conſiderable, and that of wine computed at 5000 pipes. Theſe particulars Buſching ſeems to have drawn from the Hiſtorical Geography of Portugal, by Don Luiz Caetano de Lima, 1734, 6. folio. The chief town of St. Michel is Ponta Dalgada, which has 1879 houſes, three churches and ſeven convents. The next town is Villafranca. The new iſle, which aroſe in 1720 between St. Michel and Tercera, has ſince diſappeared. Tercera is ſo called, becauſe it was the third iſle which was diſcovered. The epiſcopal city of Angra has a conſiderable port, on the eaſt of which is a mountain called *Braſil*, a name probably given by the mariners from a ſuppoſed iſle called Braſil, arbitrarily placed in the weſtern ocean in ſome old maps. Angra is a neat city, the reſidence of the governor-general ſince the year 1766, and contains five churches beſides the cathedral. Pico carries on a conſiderable trade in wine, which ſeems to be ſold as Canary. The chief town of Fayal is Horta or Huerta, probably connected with the name of Job de Huerter.

* In Portugueſe (ſee the dictionary of Vieyra), a ſtrawberry is *morango*. In the ſame language *fayã* is a beech tree, and *fayal* a place where beech trees grow, whence he ſpecially ſays is derived the name of *Fayal*, an iſland of the Azores, ſo called from the number of beech trees growing in it. The arbutus is *metronho*, ſo that our author muſt be miſtaken in his etymology.

† According to M. Kerguelen, (*Voyage dans la mer du Nord*, Paris 1771, 4to. p. 161.) there really exiſts an iſle, or rather large rock, called *Rokol*, in lat. 57° 50′ long. 16° W. of Paris; that is about five degrees S. W. of St. Kilda: another remote particle of Europe.

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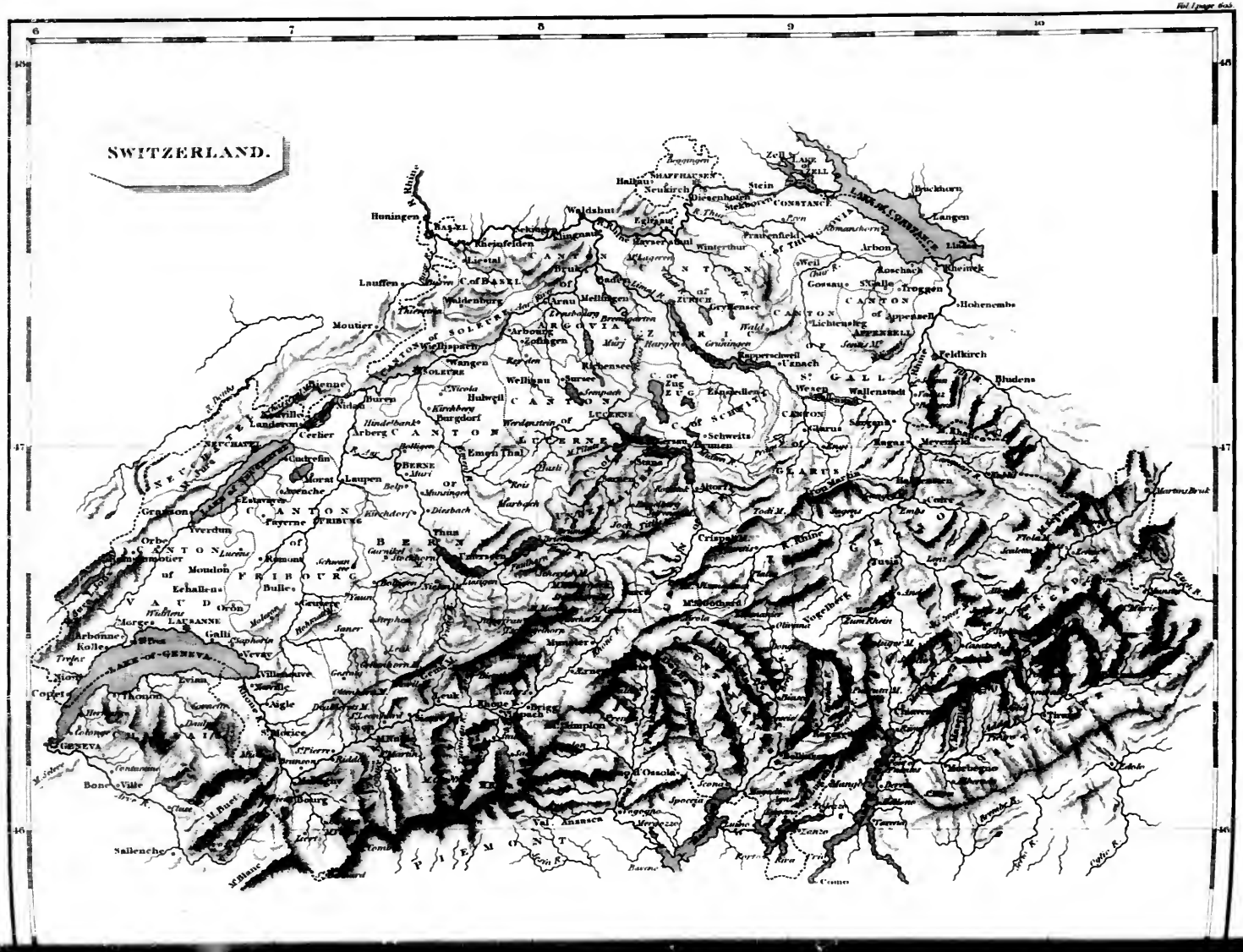

SWITZERLAND.

SWISSERLAND.

CHAPTER I.

HISTORICAL GEOGRAPHY.

Names.—Extent.—Boundaries.—Original Population.—Progreſſive Geography.—Hiſtorical Epochs and Antiquities.

THE provinces, now known by the collective name of Swiſſerland, were in ancient times diſtinguiſhed by ſeveral appellations. By the Romans they were regarded as a part of Gaul; and the chief poſſeſſors were the Helvetii on the weſt, and the Rhæti on the eaſt; the chief city of the Helvetians being Aventicum, now Avenche. After the fall of the Roman empire, this intereſting country may, in a general point of view, be conſidered as poſſeſſed by the Alemanni on the eaſt, who alſo held Suabia, and Alſace; and on the weſt as a part of Burgundia, the inhabitants being ſtyled *Burgundi trans Jurenſes*, becauſe, with regard to France, they were ſituated on the other ſide of the mountains of Jura.[1] Divided among ſeveral lords, ſecular and ſpiritual, the inheritance of the former at length chiefly centered in the houſe of Hapſburg, afterwards the celebrated family of Auſtria: and on its emancipation in the beginning of the fourteenth century firſt appeared the modern denomination of Swiſſerland, either derived from the canton of Schweitz, diſtinguiſhed in that revolution; or from

NAMES.

[1] D'Anville Etats form. en L'Europe, p. 13 93.

the

NAMES. the general name of Schweitzers, given by the Auſtrians to this alpine people. For the ſake of preciſion modern writers reſtrict the orthography of Schweitz and Schweitzer to the canton; while the general appellation for the people is the Swiſs, and for the country Switzerland, or Swiſſerland.

Extent. In length, from eaſt to weſt, Swiſſerland extends about 200 Britiſh miles; and in breadth, from north to ſouth, about 130. The contents in ſquare miles have been eſtimated at 14,960; but a great part is loſt to human induſtry, conſiſting of vaſt rocks, partly covered with eternal ice and ſnow. Even of this country the boundaries are rather arbitrary than natural; though on the weſt mount Jura form a grand diviſion from France, and on the ſouth the Pennine Alps, a partial barrier from Italy. On the eaſt lies the Auſtrian territory of Tyrol, and on the north is Suabia, containing as it were an excreſcence of Swiſſerland on the other ſide of the Rhine, the ſmall canton of Schaffhauſen.

Original Population. The original population is thought to have been Celtic; and it was reported that at the beginning of the laſt century the people of a ſmall diſtrict uſed a language reſembling the Welch. Yet it would be difficult, either from hiſtory or from ancient appellations, to trace the reſidence of the Celts in Swiſſerland; and there is every reaſon on the contrary to believe that the Helvetians were a Gothic race, a very ancient colony of Germans. Cæſar, who firſt diſcloſed the various races of men who inhabited Gaul, no where throws a poſitive light on this ſubject; but when he deſcribes Celtic Gaul as beginning beyond the Rhone, it follows that he did not regard the Helvetii as Celts; and the proximity of Germany muſt induce us to conſider the Helvetians as a German people. In the curious collection of Goldaſtus[a] there are ſeveral gloſſaries, and fragments of the ancient language uſed in this country, even in the eighth century, which thence appears to have been pure Gothic, without any Celtic admixture. The Rhæti on the eaſt are ſaid to have been a Tuſcan colony; but a faint reſemblance in manner ſometimes led the ancients to rapid concluſions. It is difficult to conceive how the poliſhed Etrurians ſhould take refuge

[a] Rerum Alamannicarum Scriptores, 1661. fol.

in the midſt of barbarous nations, or why no remains of Tuſcan buildings or art have been diſcovered in this their ſuppoſed habitation. ORIGINAL POPULATION.

The progreſſive geography of Swiſſerland may be traced with conſiderable clearneſs from the conteſt of Cæſar with the Helvetians, through the claſſic, Francic, and native hiſtorians, to the preſent time. Progreſſive Geography.

The chief hiſtorical epochs may be arranged in the following order: Hiſtorical Epochs.

1. The wars with the Romans; the ſubjugation of the Helvetii, and Rhæti, and the ſubſequent events till the decline of the Roman empire in the weſt.

2. The irruption of the Alemanni, in the beginning of the fourth century, who are by ſome ſuppoſed to have extirpated the ancient Helvetians.

3. The ſubjugation of the weſtern part of Swiſſerland as far as the river Reuſs, by the Franks, who annexed that portion to Burgundy. The Griſons on the eaſt were ſubject to Theodoric, and other kings of Italy

4. The converſion of the country to Chriſtianity by the Iriſh monks Columbanus, Gallus, and others, in the beginning of the ſeventh century.

5. The invaſion of Alemannia by the Huns* in the year 909; and the ſubſequent conteſts with theſe barbarians, till the middle of that century. The hiſtory of the abbey of St. Gal at this period is intereſting, both in a literary point of view, and from the ſingularity of the events: it was ravaged by the Huns, who were afterwards defeated by Conrad king of Burgundy, about the year 928. See the collection of Goldaſtus.

6. About the year 1030 the provinces which now conſtitute Swiſſerland be[illegible] to be regarded as a part of the empire of Germany; and in the courſe of two centuries they gradually became ſubject to the houſe of Hapſburg.

7. The commencement of the Swiſs emancipation, A. D. 1307; and the ſubſequent ſtruggles with the houſe of Auſtria.

* The Ugurs ſo called by the writers of the time. They were a branch of the Voguls, a Finniſh race.

8. The

Historical Epochs.

8. The gradual increafe of the confederacy, the Burgundian and Swabian wars; and the contefts with the French in Italy.

9. The hiftory of the reformation in Swifferland.

10. The infurrection of the peafants of Bern, in the middle of the feventeenth century.

11. The diffolution of the confederacy by the French invafion, A. D. 1798.

Antiquities.

The ancient monuments of Swifferland are not numerous, confifting chiefly of a few remains of the Romans, at Aventicum and Vinderniffa. Some alfo occur at Ebrodunum, or Yverdun, and at Baden the ancient Thermæ Helveticæ. Of the middle ages are many caftles, churches, and monafteries, the moft noble among the latter being the abbey of St. Gal, the library of which fupplied the manufcripts of three or four claffical authors, no where elfe to be found. Some interefting monuments relate to the emancipation of the country, and have contributed to extend the fpirit of freedom from generation to generation.

CHAPTER II.

POLITICAL GEOGRAPHY.

Religion.—Ecclesiastical Geography.—Government —Laws.—Population.—Army.—Revenue.—Political Importance and Relations.

THE religion of the Swiss countries is in some the Roman Catholic, in others the reformed. Of the former persuasion are Uri, Schweitz, Underwalden, cantons which founded the liberty of the country, with Zug, Lucerne, Friburg, Solothurn, part of Glarus, and Appenzel. In these are found six bishoprics, and one metropolitan see. The reformed cantons are of the Calvinist, or Presbyterian persuasion; being the rich and extensive canton of Bern, with Zurich, Basel, or according to the French enunciation Basle, Schaffhausen, the greatest part of Glarus, and some portions of Appenzel. The country of the Grisons is chiefly protestant; and Vallais, an ally of the thirteen cantons, has been the scene of atrocious persecutions on account of its disaffection from the Catholic faith: but the inhabitants, to the amount of about 100,000, now profess the Roman Catholic system. In general the two persuasions live in the most amiable unity and moderation. RELIGION.

The government of Swisserland has been a fertile theme of discussion, from the time of Burnet and Stanyan, to the modern description of that able traveller Coxe. The more powerful cantons of Bern, Zurich, Lucerne, and Friburg, had retained much of the feudal aristocratic form: and the insurrection of the peasants, in the middle of the seventeenth century, unites, with repeated discontents, to convey no high practical eulogy on the constitution, as these simple and honest vassals were not influenced by theories of sedition, but acted solely from their own feelings of oppression. In the eye of the most candid observers the aristo- Government.

Government.

cracy had degenerated into a venal oligarchy, more intent on procuring the lucrative governments of the Bailliages, than on the promotion of the general advantage. The other cantons were more democratic; but the recent subversion of the government by the French has for some time reduced Swisserland to a dependant province, with new divisions and arrangements, which, as they may prove of very short duration it is unnecessary here to describe. The laws of course partook of the nature of the government of each canton; and under the aristocracies was sufficiently jealous and severe. Yet Swisserland was one of the happiest countries in Europe; and recommended itself to the most intelligent observers equally by moral and by physical grandeur and beauty.

By the constitution of the 29th May 1801, Swisserland was divided into seventeen departments. The Pays de Vaud and Argovia were withdrawn from Bern; and the Grisons and Italian Bailliages formed two other departments. The other cantons remained as before, with some additions of ecclesiastic lands, &c. to Glaris, Appenzel, Friburg, and Basel. The abbatial territory of St. Gallen, constituted the canton of Sentis by the division of 1798, which seems to be obliterated.

The constitution dictated by France, in February 1803, includes nineteen cantons, and the diet is composed of nineteen deputies, but those of Bern, Zurich, Vaud, St. Gall, Argovia, and the Grisons have each two votes, because it is supposed that their respective population exceeds 100,000 souls. The Landaman is president of the diet, which assembles every year in the month of June. Each of the cantons retains its own laws, and has a great and a little council.

Population.

The population of this interesting country is generally computed at 2,000,000, or about 130 to the square mile.* But so large a portion is uninhabitable, that on a subtraction of such parts the number might be about 200 to the square mile.

Army.

The military force was reckoned at about 20,000; but in the late struggle with France this force appears to have been divided, and little effectual. The Swiss regiments in foreign service were computed at 29; but they returned weakened in frame and morals, and seldom proved

* The enumeration of 1801 only gave 1,499,000. *Walckenaer.*

ſerviceable to the ſtate. The permiſſion to ſerve in foreign countries has been loudly blamed as a moral deformity; but when we conſider the poverty and population of Swiſſerland, we may conceive that the want of native reſources conſpired with the ambition and curioſity, interwoven with the character of man, to ſtimulate the youth to this path of inſtruction and preferment, while the government only connived with the national wiſh.* Army.

The ruinous effects of French extortion cannot be divined; but the revenue of Swiſſerland was formerly computed at ſomewhat more than a million ſterling, ariſing from moderate taxation, from tolls, national domains, and foreign ſubſidies. The cantons of Bern and Zurich were conſidered as opulent; while in others the reſources hardly equalled the expenditure. Revenue

The political importance and relations of Swiſſerland are for a time immerged in thoſe of the French empire. Should the Swiſs emancipate their country, their chief object would be protection againſt the power of France; and in this view nothing could have been ſo ſerviceable as a ſtrict alliance with Auſtria. Political importance and Relations.

* By the conſtitution of 1803, the national force of 15,203 men is thus apportioned:

Bern	2,292 men	Appenzel	486 men.
Zurich	1,929	Soleure	452
Vaud	1,482	Baſel	429
Saint-Gall	1,315	Schweitz	301
Argovia	1,205	Glaris	241
Griſons	1,200	Schaffhauſen	233
Teſſin	902	Underwald	191
Lucerne	867	Zug	125
Thurgovia	835	Ury	118
Friburg	620		

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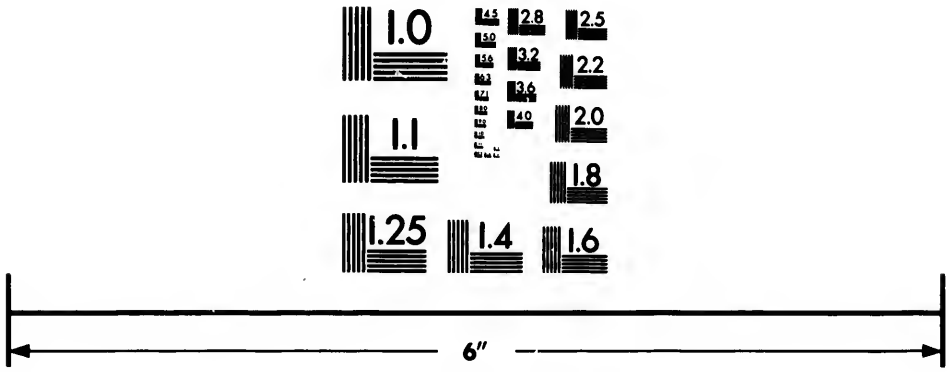

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CHAPTER III.

CIVIL GEOGRAPHY.

Manners and Cuſtoms.—Language.—Literature.—Education.—Univerſities.—Cities and Towns.—Edifices.—Roads.—Inland Navigation.—Manufactures and Commerce.

MANNERS AND CUSTOMS.

AMIDST the general corruption of manners, thoſe of the Swiſs have long excited applauſe, from their moral uniformity, and frank independence. The writings of Rouſſeau, and other celebrated authors, have depicted the Swiſs manners in almoſt every point of view, ſo that the theme has become trivial. Though moderate in diet the Swiſs are attached to wine, which produces gaiety and not irritation. The houſes are generally conſtructed of wood, in the moſt ſimple form, with ſtaircaſes on the outſide; yet their appearance ſingularly coincides with the picturesque character of the country. The dreſs of the lower ranks is little ſubject to the laws of faſhion, and in many cantons there are regulations to prevent idle ornament. Among the ſuperior claſſes the manners may be conſidered as partly German, partly French; but it may be imagined that at preſent the latter preponderate. In general the Swiſs are remarkable for an intenſe attachment to their native country; and there are few who do not return there to terminate their exiſtence. This impreſſion is almoſt irreſiſtable, and liable to be awakened by the moſt minute circumſtances. Hence in the French armies the tune called the Rance des Vaches, often ſung by the Swiſs milk maids when they went to the paſtures, was carefully interdicted, becauſe it melted the rough Swiſs ſoldier into tears, and ſeldom failed to produce deſertion. This inconquerable paſſion ſeems to ariſe in part from a moral ſenſibility to the enchanting eaſe and frankneſs of the native manners; and in part from the picturesque features of

of the country, the verdant hills contrafted with Alpine fnows, and delicious vales watered by tranfparent ftreams; fcenes no where elfe to be difcerned in fuch perfection, and which muft powerfully affect the imagination, the parent of the paffions. MANNERS AND CUSTOMS.

The language of Swifferland is a dialect of the German; but the French is much diffufed, and is often employed by their beft authors. In the moft fouthern parts, bordering on Italy, the Valteline, and other territories acquired from Milan, the Italian is the common tongue. Among the Grifons in Engadina, and in fome other parts, is fpoken what is called the Romanfh, which feems immediately derived from the Latin. The Vallais, or that part of Swifferland watered by the Rhone, has alfo a particular dialect: and at the city of Sion the French begins to be fpoken, as it is alfo the prevalent language in that beautiful part of the canton of Bern called the Pays de Vaud. The language called the Vaudois appears to have been confined to the valleys of Piedmont. Language.

Early monuments of Swifs literature, confifting as ufual of chronicles and lives of faints, may be found in the collection of Goldaftus abovementioned. Since the reftoration of letters, and the reformation of religion, Swifferland boafts of many eminent names, as the reformer Ulric Zwingli, born at Wildhaufen; De Watt, or Vadianus, a native of St. Gal; Bullinger; Herbft, who called himfelf Oporinus, the printer; Conrad Gefner, born at Zurich in 1516, who publifhed an univerfal library, and fome treatifes on natural hiftory; that noted quack Paracelfus, Turretin, and Ofterwald. Among the writers of the laft century may be named Bernoulli, the mathematician, a native of Bafel; Scheuchzer, the natural hiftorian; Haller, John Gefner, the natural philofopher; Solomon Gefner, the poet; Bonnet, Hirzel, and Zimmerman, phyficians; Rouffeau, and Necker, natives of Geneva; Lavater, the phyfiognomift; Euler the mathematician; Court de Gebelin, a learned but vifionary writer, &c. &c. Literature.

The important fubject of education has been little illuftrated by the travellers into Swifferland; but as they teftify their furprize at the knowledge generally prevalent among the peafantry, there is reafon to infer that this ufeful province is not neglected. There is an univerfity of fome reputation. Education.

EDUCATION.

reputation at Geneva, and another at Basel; with colleges at Bern, Zurich, and Lucerne.

Cities and Towns.

Basel.

In enumerating the chief cities and towns of Swisserland, according to the comparative standard of population, Basel will engage the first attention, being supposed to contain 14,000 souls. This venerable city stands in a pleasant situation, upon the banks of the Rhine, here broad, deep, and rapid, and suddenly turning to its long northern course, after a previous western direction.[1] Basel crowns both banks, and is united by a bridge. In the middle ages this city was named Basula; and appears in history soon after the age of Charlemagne, having succeeded Augst, or the Augusta Rauracorum. The cathedral is an ancient Gothic edifice; and travellers have remarked a singularity that all the clocks are one hour too fast, originally hastened, as is said, to defeat a conspiracy. The cathedral contains the tomb of the great Erasmus; and the university has produced many illustrious men.

Bern.

Bern must claim the next rank to Basel, possessing a population of about 13,000.[2] This city is of singular neatness and beauty, the streets being broad and long, and the houses of grey stone resting on arcades. There are several streams and fountains; and the river Aar almost surrounds the city. The adjacent country is rich and fertile; and the prospect of hills, lawns, wood, and water is bounded at a distance by the long chain of the superior Alps, rising like snowy clouds above the horizon. Bern contains several libraries, and collections of natural curiosities.

Zurich.

Zurich is the third in rank among the Swiss cities, situated on a large lake, amidst a populous and fertile country, which produces abundance of wine for domestic consumption. The college and plans of education are respectable; and the public library contains some curious manuscripts.

Lausanne.

Lausanne contains about 9000 inhabitants, and is deservedly celebrated for the beauty of its situation, though in some spots deep and rugged. The church is a magnificent Gothic building, having been a cathedral, while the Pays du Vaud was subject to the house of Savoy.

[1] Coxe, i. 149. [2] Ib. ii. 226.

The

The other chief towns are St. Gal, an ally of Swifferland under the former government. Mulhaufen, alfo an ally. Geneva, a city of 25,000 inhabitants, has been affigned to France. Friburg and Schaffhauffen contain each about 6000 inhabitants; Lucerne, Solothurn, and Eienfiedlen, about 5000 each. Few of the others exceed 3000. Cities and Towns.

The chief edifices of Swifferland are in the cities; and there are few examples of magnificent dwellings erected by men of wealth or opulence. Inland navigation is partly interdicted by the mountainous nature of the country, partly rendered unneceffary by numerous rivers. Edifices.

Commerce and manufactures do not much flourifh in this inland region. Cattle conftitute the chief produce of the country; and fome of the cheefe forms an export of luxury. The chief linen manufactures were at St. Gal. Printed cottons, and watches, alfo form confiderable articles of fale; nor are filk manufactures unknown in Swifferland. Commerce and Manufactures.

CHAPTER IV.

NATURAL GEOGRAPHY.

Climate and Seasons.—Face of the Country.—Soil and Agriculture.—Rivers.—Lakes.—Mountains.—Forests.—Botany.—Zoology.—Mineralogy.—Mineral Waters.—Natural Curiosities.

CLIMATE AND SEASONS.

THE climate of Swisserland is deservedly celebrated as salubrious and delightful. From its southern position considerable heat might be expected; but this, though sufficient to mature the grape, is attempered by the cold gales from the Alps and glaciers. When the sun descends beyond Mount Jura, on a summer evening, the Alpine summits long reflect the ruddy splendour, and the lakes for near an hour assume the appearance of burnished gold. The winter is however in some parts extremely severe; and the summer heat in the deep vales sometimes oppressive.

Face of the Country.

The face of the country is generally mountainous, the most level parts being the Thurgau, and a part of the cantons of Basel, Bern, Zurich, Schaffhausen, Soleure, and Friburg. Even these present what in some countries would be called mountains, from 2000 to 2500 feet above the level of the sea. No country in the world exceeds Swisserland in diversity of appearance; the vast chain of Alps with enormous precipices, extensive regions of perpetual snow, and glaciers that resemble seas of ice, are contrasted by the vineyard, and cultivated field, the richly wooded brow, and the verdant and tranquil vale, with its happy cottages and crystal stream. Agriculture cannot of course be carried to great extent; but there is no defect of industry, and the grain seems sufficient for domestic consumption. Barley is

Soil and Agriculture.

cultivated

cultivated even to the edge of the glaciers; oats in regions a little warmer; rye in thoſe ſtill more ſheltered; and ſpelt in the warmeſt parts. Yet in general the produce does not exceed five for one; and it has been neceſſary to ſupport public granaries in caſe of any deficiency. For the country being principally deſtined by nature for paſturage, the chief dependance of the Swiſs is upon his cattle, and the number being extraordinary, much land is laid out in winter forage, which might otherwiſe be productive of corn.[1] A conſiderable quantity of lint and flax is alſo cultivated; and tobacco has been lately introduced. The beſt vines are thoſe of the Pays de Vaud, the cantons of Bern, and Schaffhauſen, the Valteline, and the Vallais. There is alſo abundance of fruits, apples, pears, plums, cherries, filberts; with mulberries, peaches, figs, pomegranates, lemons, and other products of a warmer climate, in thoſe diſtricts which border upon Italy. The Vallais alſo produces ſaffron. Soil and Agriculture.

But paſturage forms the chief province of the Swiſs farm; and the meadows are often watered to increaſe the produce of hay. In the beginning of ſummer the cattle are conducted to the acceſſible parts of the Alps, by cow-herds, who are called Sennen in the language of the country, and who either account to the proprietor for the produce, or agree for a certain ſum. Thoſe herds alſo ſupport many ſwine, with the butter-milk, and other refuſe. Scheuchzer, in his firſt journey to the Alps, deſcribes the numerous preparations of milk, which form varied luxuries of the ſwains.

The rivers of Swiſſerland are numerous; and among the moſt ſublime ſcenes of this country muſt be claſſed the ſources of the Rhine and the Rhone, two of the moſt important ſtreams in Europe. If we eſtimate their length of courſe through the Swiſs dominions, the Rhine is the moſt conſiderable; and is followed by the Aar, the Reuſs, the Limmat, the Rhone, and the Thur. Rivers.

The Rhine riſes in the country of the Griſons, from a glacier upon the ſummit of Mont Bedus, or Badur, at the head of a valley, about nine leagues in length, called the Rhinewald.[2] This mountain and Rhine.

[1] Buſching, xiv. 12.
[2] Coxe, iii. 243. Bourrit, Deſcript. des Glaciers, tome iii. p. 62.

Rivers. valley are little visited, even by the Swiss; and the upper part presents dreadful desarts of ice and snow, through which the stream descends, sometimes visible, sometimes working a hidden track beneath frozen arches. Such is what is esteemed the chief source of the Rhine, being that styled by the French the Upper Rhine, and in German the Hinter, or nearer Rhine. The middle Rhine, which rises not far from mount St. Gothard, is indeed the longest stream, whence its source was formerly ascribed to that celebrated mountain; yet the most eastern is probably the more considerable. The celebrated Saussure,[3] than whom there cannot be a higher authority on these topics, informs us that the further Rhine, which he supposes to be so called because it is nearest to Germany, arises from a chain of mountains at the head of the valley of Disentis, called Crispalt, while their highest point is styled Badur: that the middle Rhine proceeds from the valley of Medelo, an appendage of St. Gothard: and these two torrents united receive a third from mount Avicula, called in French the Upper Rhine, and in German the Hinter Rhein, for in some French maps the names are inverted.* The heights here are about 6180 feet above the sea. From its source the Rhine pervades or borders Swisserland, for about the space of 200 British miles, running N. E. to the lake of Constance, whence it bends W. to Basel; where it begins its long northern course.

Aar. The Aar arises in the Alp called Grimsel,[4] but there is a further source in the environs of that terrible summit styled the Schreckhorn and another from the glaciers of Finsteraar: bending its course to the N. W. till it arrive near Arberg, it afterwards turns N. E. receives the Reuss and the Limmat, and joins the Rhine opposite to Waldshut, after a course of about 150 British miles.

Reuss. The Reuss, which divides Swisserland into almost two equal parts, eastern and western, springs from the lake of Lucendro,[5] on the N. W. of St. Gothard. This lake is long and narrow, the upper part being surrounded with black precipices, spotted with eternal snow; while the

[3] Voyage dans les Alpes, tome vii. p. 72. 8vo.
* Mr. Coxe, and Bourrit, have confounded the Upper and Lower Rhine. See Weisse's map.
[4] Coxe, i. 342. [5] Saussure, vii. 44.

lower

lower presents a little verdant plain. From the other side of St. Gothard rises the Italian stream of the Tesino, which flows into the Po not far below Pavia. The Reuss joins the Aar, after a course of about 80 British miles. Rivers.

The Limmat is composed of two streams, the Linth, which rises in the S. of the canton of Glarus, and the Mat* which springs in the country of Sargans. About ten miles after their junction, the Limmat enters the lake of Zurich, whence it flows about 20 British miles before it join the Aar. On the banks of the Limmat commenced that dreadful conflict of the French against the Austrians and Russians, which extended down those of the Reuss, the line of battle being said to have reached for 90 miles; while for fifteen successive days the whole region seemed enveloped in fire and smoke.† Limmat.

The Rhone, a noble stream, can only be regarded as a Swiss river prior to its entering the lake of Geneva, after a course of about 90 British miles through that extensive vale called the Vallais. This river rises in mount Furca, the source being rather warm, and about 5400 feet above the sea. Yet in truth this source joins a more considerable stream, from an extensive glacier called that of the Rhone, where the majestic river god resides in his palace of arches formed under perpetual ice.‡ Rhone.

The Thur, a moderate current, rises in the S. of the country of Tokenberg, and pursues a N. W. direction to the Rhine. Other considerable streams are the Sana, and the Emme, which join the Aar, the Inn which commences his majestic progress in the Grisons, the Adda which waters the Valteline, and falls into the lake of Como, and the Tose and Glatt which join the Rhine. Thur.

The lakes of Swisserland are numerous and interesting. The most considerable are those of Constance on the N. E., and Geneva in the S. W. The former is about 45 British miles in length, and in some places 15 in breadth. This beautiful expanse of water is by the Lakes. Constance.

* Weiss calls this river the Senez.

† New Annual Register 1799, p. 447. This conflict spread in breadth from the Reuss to the Rhine. In Myttenthal, to the east of Schweitz, Suwarrof was defeated.

‡ Saussure, vi. 284, &c.

Lakes. Germans alſo ſtyled the Boden Zee. Towards the N. W. it is divided into two parts, called the upper and the lower lake, the latter of which contains the iſle of Reichenau. Like all the other lakes of Swiſſerland, it is deeper in the ſummer than in the winter, owing to the melting of the ſnows, and is remarkable for producing large red trout.

Geneva. The lake of Geneva extends in the form of a creſcent, about 40 Britiſh miles in length, and nine at its greateſt breadth. The beauties of this lake have been celebrated by Rouſſeau; but would be conſiderably increaſed if it were ſprinkled with iſlands.

Only a part of the lake Maggiore, or that of Locarno, is ſubject to Swiſſerland; but the lake of Lugano forms an extenſive body of water in that region. The lakes of Neufchatel and Zurich are each about twenty-five miles in length, by about four in breadth. That of Lucerne is about fifteen in length, and the breadth no where above three. Next to theſe are the lakes of Thun and Brientz; of Joux and Rouſs, on the French confines; the lakes of Morat, and Bienne, of Sempach, Zug, Wallenſtadt, and others of inferior note.

Mountains. The mountains of Swiſſerland are the moſt celebrated in Europe; and are ſuppoſed to yield in height to none, except thoſe of South America, which derive their advantage from ſtanding on an elevated plain. In a general point of view the Alps extend, in a kind of ſemicircular form, from the gulph of Genoa through Swiſſerland, which contains their centre and higheſt parts; and cloſe in the Carnic Alps on the N. of the Adriatic ſea. This grand chain of mountains has, in ancient and modern times, been divided into different portions, known by diſtinct appellations. The maritime Alps are thoſe which ariſe from the gulph of Genoa. Mont Genevre, whence ſprings the river Durance, was anciently named the Alpis Cottia, from Cottius a prince who reſided at Suza. Further to the N. were the Alpes Graiæ, now the little St. Bernard. The Alpes Penninæ conſiſted of the great St. Bernard, Mont Blanc, and the grand chain extending on the S. of the Rhone to the N. of modern Piedmont; the eaſtern part being alſo ſtyled the Lepontine Alps, from a people who inhabited that region which gives origin to the Rhone and Teſino. The Rhætian Alps extended through the Griſons and Tyrol, terminating in the Carnic,

Alps.

Carnic, or Julian Alps. That chain which pervades Swiſſerland, from mount Sanetz in the S. W. towards the ſources of the Inn on the N. E. was known by the appellation of the Helvetian Alps. Some writers admit of more minute diviſions, as the Tridentine Alps above Trent; and the Noric Alps about the ſource of the river Tajamento. The extent of this vaſt courſe of mountains may be computed at about 550 Britiſh miles. MOUNTAINS.

The central part of this magnificent chain may be conſidered as divided into two ridges, running almoſt parallel from the ſouth weſt to the north eaſt. The firſt ridge is that of the Helvetian Alps, of which the moſt conſpicuous ſummits are the Gemmi, or Guemmi, the Schelenhorn, the Blumlis, the Geisſhorn, the Jungfrau, or Virgin horn, the Eiger, the tremendous Schreckhorn, or peak of terror, the Grimſel, the Furca; the extenſive and ſomewhat devious ridges of mount St. Gothard, the Badur, and the glaciers to the north of the further Rhine. Of this chain the St. Gothard has been long conſidered as one of the principal ſummits, becauſe important rivers run from its vicinity in every direction, but this circumſtance cannot be admitted to argue for its ſuperior height, after the accurate obſervations of Sauſſure; and rivers often ſpring from an inconſiderable elevation, paſſing in the bottoms between high mountains. The celebrated naturaliſt of Geneva has chiefly confined his obſervations to the ſouthern chain of the Alps; and the beſt account of the northern chain appears to be that communicated by M. Wyttenbach to Mr. Coxe.[7] The Jungfrau ſeems the moſt elevated mountain of this chain; and to the weſt are the inacceſſible peaks called Gletſcherhorn, Ebenfluh, Mittaghorn, Groſſhorn, Breithorn. Next in elevation ſeem to be the Eiger, and the Schreckhorn: yet ſome ſuppoſe that they yield to the Finſter Aarhorn, which is only acceſſible from the Grimſel.* The ſummits conſiſt of granite, St. Gothard.

[7] Swiſſerland, ii. 309.

* Sauſſure, vol. vii. p. 193, informs us that Mount Titlis, to the north of Mount Furca, is 10,818 feet above the ſea; and that the Schreckhorn, and the Finſteraar, ſouth of the Schreckhorn, are at leaſt 2400 feet higher. If ſo, theſe ſummits are about 13,218 feet, while Mont Blanc is 14,7000 French feet: by the meaſurement of Sir George Shuckborough 15,662 feet Engliſh.

The

Mountains.

granite, generally, it is believed, the white; and the ſides diſcloſe red ſlate, and calcareous maſſes. In general the granite appears in the ſouth; and the calcareous ſuperpoſitions on the north. The mountain of Guemmi, or the Twins, ſo called from its two ſummits, has been deſcribed by Bourrit. To the ſouth are large deſarts and glaciers; and on the north is the romantic lake of Kandel Steig, whence there is ſaid to have been a paſſage to Lauterbrun amidſt ſingular glaciers, ſometimes reſembling magical towns of ice, with pilaſtres, pyramids, columns, and obeliſks, reflecting to the ſun the moſt brillant hues of the fineſt gems. Yet according to the latter author[8] this chain is inferior to the ſouthern in height; as mont Blanc ſeems one maſs of ice, while in the northern chain the ice forms the ſmalleſt part.

Guemmi.

The ſouthern chain of the central Alps rather belongs to the north of Italy, than to Swiſſerland. It extends from mont Blanc and ſome eminences further to the weſt, and embraces the great St. Bernard, the Weiſeh, mount Cervin, and mount Roſa. Paſſing to the north of the lakes of Locarno and Como, under the names of Vogelberg, St. Bernardine, Spluger, Albula, Bernini, &c. it ſtretches into Tyrol* ter-

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The doubts ſeem to be removed by the maps of Swiſſerland, by Weiſs, ſheet 10, in which the heights are ſtated as follow, in French feet: Yungfrawhorn, 11,085; Munch, 10,879; Eiger, 10,481; Finſter Aar, 11,447; Schreckhorn, 10,773; Wetterhorn, 9,966.

For this northern chain the reader may alſo conſult Bourrit, vol. ii. p. 134, (who obſerves its courſe from M. Sanetz to St. Gothard;) and the greater part of his third volume. St. Gothard is of great extent, with many ſummits, of which the higheſt is called Petina; and in the eaſt begins a high ridge ſtyled that of Adula, which is ſucceeded by the Criſpalt, forming the ſouthern boundary of the canton of Glarus (vol. iii. p. 62.). In his opinion, iii. 194, the Schreckhorn is the higheſt of the Swiſs Alps. General Pfeffer, who made a noted model of the northern Alps, computes the height of St. Gothard above the ſea at 9075 feet, (Coxe, i. 320.) Mr. Kirwan, Geo. Eſſ. 213, 217, ſays that the Finſteraar Horn, Schreckhorn, Jungfrau, &c. are all of granular or primitive limeſtone; and ſuppoſes their height only to exceed 10,000 feet, quoting Helv. Mag. iv. 115, 116; but perhaps the ſkirts only were examined.

By Col. Crawford's obſervations, a peak of Himala ſeen from Patna, exceeds 20,000 feet above Nipal, which is probably 5000 feet above the ſea.

[8] Bourrit, iii. 59.

* The great Glockner, between Tyrol and Salzia, is ſaid to be 12,630 feet. The Ortels in Tyrol has even been computed at 14,000 feet. By other obſervations the higheſt mountains in Tyrol are ſaid to be the Plaley Kogel, 9748 Pariſian feet above the ſea: the Glockner 11,500, the Ortels 12,000. See an eſtimate of the heights of the mountains in Italy and Germany (rather in Salzburg chiefly,) Monthly Magazine, vol. ix. p. 539.

minating

minating in the Brunner, or Rhætian Alps on the S. of the Inn, if it be not considered as extending even to Salzburg; while the first chain to the N. of that river, divides Bavaria from Tyrol. This second chain has been ably illustrated by Saussure, who first visited the summit of Mont Blanc, the greatest elevation on the ancient continent, being about 14,700 feet above the level of the sea. In his last journey Saussure also visited Mont Rosa, which only yields sixty feet in height to Mont Blanc, being about midway between great St. Bernard and the lake of Locarno, where our maps place a non-existence called Mont Moro, to the N. of Macugnana in the vale of Anzasca. Yet some affected to doubt whether the tremendous, and hitherto inaccessible, heights of the northern chain did not exceed those measured by Saussure; and they certainly present sufficient objects for the ambition of future travellers. Mountains.

It was reserved for this age of enterprize to disclose the secret wonders of the superior Alps. The enormous ridges clothed with a depth of perpetual snow, often crowned with sharp obelisks of granite styled by the Swiss horns or needles; the dreadful chasms of some thousand feet in perpendicular height, over which the dauntless traveller stands on a shelf of frozen snow; the glaciers or seas of ice, sometimes extending thirty or forty miles in length; the sacred silence of the scenes before unvisited, except by the chamois and goat of the rocks; the clouds, and sometimes the thunder storm, passing at a great distance below; the extensive prospects, which reduce kingdoms as it were to a map; the pure elasticity of the air exciting a kind of incorporeal sensation; are all novelties in the history of human adventure.

With regard to the constitution of these grand chains we learn from Saussure[9] that the highest summits consist of a large grained granite; the mixture being white opake felspar, greyish, or white semitransparent quartz, and mica in small brilliant scales, thus forming what is called the white granite. The colours sometimes vary; and sometimes Constitution.

[9] Tome ii. 334. Saussure sent to Lametherie, at Paris, a specimen of his *Palaiopetre* from the very summit of Mont Blanc. It is compact felspar, fusible by the blow-pipe, mixed with a small portion of steatite.

hornblend,

Constitution.

hornblend, ſchorl, garnets, or pyrites, are interſperſed. The conſtruction ſeems to conſiſt of flat pyramids of granite, ſtanding vertically, diſpoſed like the fruit of the artichoke; thoſe of the centre being moſt upright, while the others bend towards them. Theſe flat pyramids commonly ſtand, like the grand chains of the Alps, in a N. E. and S. W. direction. Beneath, and incumbent on the granite, eſpecially towards the N. appear large maſſes of ſlate; which are followed by exterior chains of high calcareous mountains. The reader, who is deſirous of more minute details concerning thoſe magnificent features of nature, may conſult the works of Sauſſure, and other celebrated naturaliſts, who have written profeſſedly on this intereſting topic.*

Foreſts.

Of foreſts there does not appear to be any ſemblance in Swiſſerland; and ſuch is the ſcarcity of wood, and even of turf, that the dung of cows and ſheep is often uſed for culinary fire.

Botany.

Swiſſerland, from its ſouthern climature and its elevated ſituation, may be conſidered with regard to its botany as an epitome of all Europe.† From its low ſunny vallies that open upon the Italian frontier, to the higher Alps covered with glaciers and eternal ſnow, the traveller may experience in ſucceſſion the climates of Lapland, Germany, France, and Italy. Of maritime plants, on account of its inland ſituation, it poſſeſſes none; and many of thoſe which adorn, and perfume the arid tracts of heath in Spain, and Portugal are equally wanting. The ſwamps of Holland alſo poſſeſs many that are ſtrangers to Swiſſerland; but thoſe ſpecies that delight in the pure invigorating

* Sauſſure informs us, vii. 278, that the higheſt rocks of Mont Blanc are granites with little or no mica, but in its ſtead hornblend, or ſteatite; and maſſes of black hornblend with white felſpar, but ſmall grained like trap. There alſo appears petroſilex (rather felſite, or compact felſpar), of a pearl grey colour, tranſlucid on the margin, and ſcaly; it is veined and contains little neſts of green hornblend, or rather actinote. The ſame excellent obſerver found on the S. E. of Mont Blanc, on the glacier of Miage near Mont Broglia, the celebrated granite of Corſica, in concentric circles of black hornblend and white felſpar, with another ſort in bands, and another in zigzag. This beautiful rock deſerves to be explored by ſome enterpriſing naturaliſt. In other parts of the Alps, Sauſſure obſerved a rock of quartz, mica, and limeſtone, which he obſerves is a ſingular mixture, often found, though unknown to writers on mineralogy. It is abundant in North America.

Sir George Shuckborough's obſervations on the heights of mountains may be found in the ſixty-ſeventh volume of the Philoſophical Tranſactions, for 1777.

† Haller, Enumeratio Stirp. Helvet. Dr. Smith's Travels.

air of the mountains, that drink life and fragrance from the dashing torrent, that bend over the margin of the transparent lake, and luxuriate in the sheltered recesses of the overhanging rock, flourish here in a profusion and glow of beauty that cannot be conceived by the inhabitant of Lowland countries. BOTANY.

The spiry pinnacles of rock that rear themselves from among the perpetual snows that overspread the summits of the higher Alps, are almost wholly destitute of vegetation; a few of the crustaceous lichens, and here and there a tuft of *Silene acaulis*, and *saxifraga nivalis*, and *stellaris*, comprise the whole of their scanty flora.

From the very edge of the snow commences a zone of rocky pasturage, the native domain of the bounding chamois, but encroached upon for a few weeks in the height of summer by the sheep; covered with a short barren turf, except where the rills, trickling through, give birth to a more luxuriant vegetation: the effect of the cold is here strikingly displayed, not merely in the plants being all of them truly alpine, but from their being shrunk and condensed into such minute specimens as to require a close inspection to be aware of their vast variety.

Still further from the summits the pasturage becomes more abundant and accessible to the cattle for about forty days at Midsummer: a few of the hardier shrubs begin to make their appearance, and the turf here assumes that truly enamelled appearance that is so characteristic of Switzerland: the more exposed situations offer to the botanist *scutellaria alpina*, *gentiana acaulis*, *globularia nudicaulis*, *pedicularis verticillata*, *bartsia alpina*, *saxifraga cæsia*, and *rosa alpina*, all of them plants of exquisite beauty; *astrantia major*, and *saxifraga rotundifolia* of less ostentatious charms, and several viviparous grasses. In the alpine vallies, and along the course of the torrents, vegetation assumes a more stately appearance; the juniper, the savine, the stone pine, and alder, broken by nature into irregular thickets, diversify the scene; their edges are bordered with *cacalia alpina*, *aquilegia alpina*, *ranunculus aconitifolius*, and *pyrola minor*; the cascades are overhung with bowers of the alpine rose, and snowy *mespilus*; in the clifts of the rocks are tufts of *saxifrages*, *auricula*, and the rare *saponaria lutea*: and the spungy hillocks are eminently resplen-

Botany. dent with *rhododendron ferrugineum*, *azalea procumbens*, *pinguicula alpina*, and *saxifraga aizoides*.

Below all these, on the declivities of the mountains, commence the forests of larch, of pine, and fir, intermixed here and there with the yew, the mountain ash, and the birch; under their shade are found *pyrola uniflora*, *linnæa borealis*, and other natives of the Scandinavian forests.

Among these upper woodlands are the richest meadows of Swisserland, luxuriant with grass and clover, and ornamented with yellow gentian, the white hellebore, *actæa spicata*, *anemone alpina*, and *pulsatilla*, and innumerable other mountain plants.

Where the firwoods cease the subalpine regions begin, diversified with meadows and corn fields, and forests of deciduous trees. The oak, the elm, the beech, the ash, the lime, and the hornbeam are the most prevalent, and the borders of the streams are shaded by poplars, and willows. The plants are chiefly those which occur in the north and midland parts of France and Germany. The dry stony places are occupied by *arbutus uva ursi*, *vaccinium vitis idæa*, *cratægus cotoneaster*; in woods are found *daphne gnidium*. *aconitum napellus*, several species of *helleborus* and *convallaria*: and the pastures, and hedge sides yield the orange and martagon lilies; the branched *asphodel*, the *iris germanica*, clustered hyacinth, narcissus, and daffodil, with an innumerable multitude of *orchideæ*.

The lowest and warmest situations in Swisserland are the plains and broad vallies of Geneva, of Basel, of the Pais de Vaud, of the Valteline, and La Vallais; in these we meet with numerous vineyards, and the trees and plants of the south of France, and Italy. The walnut, the chestnut, the fig, the pomegranate, the bay, and laurel, Cornelian cherry; *celtis australis*, and *mespilus amelanchier* are the most characteristic among the trees; the lavender, *cretan origany*; hyssop; *atropa mandragora*; *fraxinella*, rue; several kinds of *cistus*, and *peony*, are some of the chief of the herbaceous plants and lower shrubs. The valleys that open towards Italy contain, besides, a few plants that are not found in the

the reſt of Swiſſerland; ſuch as the *lilac*, the *caper buſh*, the *almond*, Indian fig; and *American aloe*. Botany.

The horſes of Swiſſerland are eſteemed for vigour and ſpirit; and the cattle often attain great ſize. Among the animals peculiar to the Alps may be firſt named the ibex, bouqetin, or goat of the rocks; of which a good account with an engraving is given by Mr. Coxe.[10] This animal reſembles the common goat; but the horns are extremely long and thick, and of ſuch ſtrength as to ſave them in headlong deſcents from the precipices. It is more common on the Italian than on the Swiſs Alps. The hair is long, and aſh coloured, with a black liſt along the back. The female is one third leſs than the male; and her horns are ſmall, while thoſe of the male are about two feet ſix inches in length. The bouquetin will mount a perpendicular rock of fifteen feet, at three ſprings, bounding like an elaſtic body ſtruck againſt a hard ſubſtance. In the day he ſeeks the higheſt ſummits, but in the night the neareſt woods, browſing on aromatic plants and dwarf birch, and in the winter on lichens. His common cry is a ſharp ſhort whiſtle. The chace is raſhly dangerous, and expoſed to many accidents. Zoology. Ibex.

Another ſingular animal is the chamois, which belongs to the genus of antelope; and is commonly ſeen in herds of twenty or thirty, with a centinel who alarms them by a ſhrill cry.[11] The colour is yellowiſh brown; but they ſometimes occur ſpeckled. The food is the lichen with ſhoots of pine or fir. The marmot is common in the Swiſs mountains. In ſummer they feed on Alpine plants, and live in ſocieties, digging dwellings in the ground for ſummer, and others for winter. About the beginning of October, having provided hay, they retreat to their halls, where they remain torpid till the ſpring. The ſkin of this little animal is uſed for furs. The marmot may be tamed, and ſhews conſiderable docility. The ſize is between that of the rabbit and the hare. Chamois.

Among Alpine birds may be named the vulture, called alſo the golden or bearded vulture. The head and neck being covered with feathers it might be claſſed with the eagles, were it not for the form of the body,

[10] ii. 53, &c. [11] Ib. i. 343.

Zoology. and ſhape of the beak. It inhabits the higheſt Alps, forming its neſt in inacceſſible rocks, and preying on the chamois, white hare, marmot, and ſometimes on kids and lambs. Among Alpine birds may alſo be named the red legged crow, and turdus cæruleus. The lakes of Swiſſerland have few peculiar fiſh.

Mineralogy. The mineralogy of this intereſting country is not ſo important as we might be led to infer from its mountainous nature. Some of the ſtreams waſh down particles of gold, as the Rhine, the Emmat, the Aar, the Reuſs, the Adda, and the Goldbach.[12] Mines of ſilver are mentioned but the places are not ſpecified. Copper and lead are alſo found; but the chief mines are thoſe of iron in the country of Sargans. In the canton of Bern there are valuable quarries of rock ſalt;* and it is ſaid that coal and native ſulphur are not unknown. But the grand ſtores of minerals are in Piedmont, and the ſouthern ſides of the Alps; as in Hungary they are in the ſouth of the Carpathian mountains; and the richeſt minerals are alſo found in the ſouth of the Pyrenees. In ridges running north and ſouth, it is believed the eaſtern ſide is generally the moſt productive. Rock cryſtal forms perhaps the chief export of Swiſſerland, being ſometimes found in ſuch large pieces as to weigh ſeven or eight hundred weight. The calcareous part of the Alps often preſent beautiful marbles, and good ſlates are not uncommon. As to granite and porphyry the country may be ſaid to conſiſt of them. Among the Alps are alſo found ſerpentines, ſteatites, aſbeſtos, amianthus; with jaſpers, agates, and various petrifactions. Near Chiavana is a quarry of grey lapis ollaris, which has been long wrought into pots of various dimenſions, and which will ſtand the fierceſt fire. Among the mineralogic curioſities may be named the adularia, or glaſſy felſpar, on the mountains of Adula already mentioned; and the tremolite, ſo called from the valley of Tremola near St. Gothard.

Mineral Waters. Of mineral waters the moſt remarkable are thoſe of Leuk. Scheuchzer, in his third journey, deſcribes the ſingular warm baths of Fabara, or Pfeffers, in the country of Sargans, to which the viſitants paſſed through

[12] Buſching, xiv. 11.

* Keyſler, i. 146. ſays that the ſalt works are at Bevieur, Roche, and Paner, in the Pays de Vaud.

a long

a long narrow chafm, by a path extremely dangerous. To the S. E. are the baths of Alvenew, which are fulphureous, and refemble Harrowgate water. As fuch baths commonly belong to calcareous countries, it is believed that Swifferland cannot boaft of many. Mineral Waters.

To enumerate the natural curiofities of Swifferland would be to defcribe the country. The Alps, the glaciers, the vaft precipices, the defcending torrents, the fources of the rivers, the beautiful lakes and cataracts, are all natural curiofities of the greateft fingularity, and moft fublime defcription. Of late the glaciers have attracted particular attention; but thofe feas of ice, interfected with numerous deep fiffures, owing to fudden cracks which refound like thunder, muft yield in fublimity to the ftupendous fummits clothed with ice and fnow, the latter often defcending in what are called avalanches, or prodigious balls, which gathering as they roll fometimes overwhelm travellers and even villages. Nay the mountains themfelves will fometimes burft and overwhelm whole towns, as happened in the memorable inftance of Pleurs near Chiavana, in which thoufands perifhed, and not a veftige of a building was left: nor are recent inftances, though lefs tremendous, wholly unknown. The vaft refervoirs of ice and fnow give birth to many important rivers, whofe fources deeply intereft curiofity. As an example, the account which Bourrit gives of that of the Rhone may be felected. " At length we perceived through the trees a mountain of ice as fplendid as the fun, and flafhing a fimilar light on the environs. This firft afpect of the glacier of the Rhone infpired us with great expectation. A moment afterwards this enormous mafs of ice having difappeared behind thick pines, it foon after met our fight between two vaft blocks of rock, which formed a kind of portico. Surprized at the magnificence of this fpectacle, and at its admirable contrafts, we beheld it with rapture. At length we reached this beautiful portico, beyond which we were to difcover all the glacier. We arrived: at this fight one would fuppofe one's felf in another world, fo much is the imagination impreffed with the nature and immenfity of the objects. To form an idea of this fuperb fpectacle, figure in your mind a fcaffolding of tranfparent ice, filling a fpace of two miles, rifing to the clouds, and darting flafhes of light like the fun. Nor were the feveral parts Natural Curiofities.

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NATURAL CURIOSITIES.

leſs magnificent and ſurpriſing. One might ſee as it were the ſtreets and buildings of a city, erected in the form of an amphitheatre, and embelliſhed with pieces of water, caſcades, and torrents. The effects were as prodigious as the immenſity and the height; the moſt beautiful azure, the moſt ſplendent white, the regular appearance of a thouſand pyramids of ice, are more eaſy to be imagined than deſcribed. Such is the aſpect of the glacier of the Rhone, reared by nature on a plan which ſhe alone can execute: we admire the majeſtic courſe of a river, without ſuſpecting that what gives it birth and maintains its waters may be ſtill more majeſtic and magnificent." He afterwards deſcribes the river as iſſuing from a vault of ice, as tranſparent as cryſtal; and illuminated by ſtreams of ſunſhine darting through apertures in the roof.

In the Vallais, above Siders, the banks of this river are ſingularly ſtudded with conical hills, ſometimes crowned with wood, ſometimes with ancient caſtles. On the north of Swiſſerland the Rhine, near the village of Neuhauſen, deſcends in a cataract of 40 feet amidſt black and horrid rocks. Among the milder charms of Swiſſerland may be named the lakes; and the ſmall lake of Kandel Steig bears at one extremity the charms of ſummer, while the other preſents the glaciers and pomp of winter. Numerous rills, which deſcend from the mountains, often fall in caſcades of great beauty, among which that of Staubbach is computed at 900 feet, over a rock as perpendicular as a wall,[1]. The verdant vales, ſometimes bordered with perpetual ice, alſo delight the traveller; who may be inclined, in theſe corrupt times, to conſider as a natural curioſity the frank and ſimple manners of the inhabitants.

Valais.

The Valais now forms a little independent republic. It is a rich valley, watered by the Rhone, about eighty-five miles in length, and containing about 90,000 inhabitants. The chief town is Sion formerly the ſeat of the biſhop. On the ſouth of the valley is Mount Simplon, where a noble road has been conducted from France into Italy.

[1] Bourrit, iii. 163.

STATES OF THE THIRD ORDER.

THE ſtates of the third order moſtly belong to Germany. If in the chain of recent events Italy ſhould become one kingdom, a favourite, and not illaudable object of the ambition of a great modern victor, himſelf an Italian, it muſt, from extent and population, not to ſpeak of ancient fame and dignity, aſſume its poſition among the principal powers of Europe. But till this change ſhall have been matured by ſome duration, and the concurrence of the other European powers, the long eſtabliſhed foundations of geographical ſcience muſt not be raſhly ſacrificed to changes which may prove of a temporary nature. The deſcription and diviſions of Italy are beſides ſo intimately connected with ancient and modern hiſtory, that the ſubjection of the whole to one ſovereign would not injure any eſſential part of the ſubſequent brief view of this intereſting country.

GERMAN STATES.

CHAPTER I.

General Description of Germany.

Extent.—Boundaries.—Original Population.—Progreſſive Geography.—Hiſtorical Epochs.—Antiquities.—Religion.—Population.—Army.—Navy.—Language—Literature.—Roads.—Face of the Country.—Rivers.—Lakes.—Mountains.—Foreſts.—Botany.—Zoology.—Mineralogy.—Mineral Waters—Natural Curioſities.

IN deſcribing an extenſive country, ſubdivided into many ſtates, it becomes indiſpenſable to give a general idea of the whole, before the reſpective territories are delineated. The geography of Germany

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is the moſt perplexed of any region on the globe, the great diviſions, or *circles*, being now interwoven, and almoſt antiquated, while no modern and more rational diſtribution has yet appeared. This obſervation even extends to the inferior ſtates, many of which are *enclavées*, or mortiſed in each other.*

Extent.

Germany, conſidered in its modern limits, extends about 600 Britiſh miles in length, from the iſle of Rugen in the north, to the ſouthern limits of the circle of Auſtria. The modern breadth, from the Rhine to the eaſtern boundary of Sileſia, is about 500 Britiſh miles: anciently the breadth extended beyond the Viſtula, about 200 miles more to the eaſt, a ſpace ſince filled by the Poles, a Slavonic nation.

Original Population.

This country appears to have been full of extenſive foreſts, even in the Roman period; and of courſe to have been in many parts thinly peopled, yet there are faint indications that the Cimbri, or modern Celts, poſſeſſed ſeveral tracts in the ſouth, as they certainly held a large portion of the N. W. On the N. E. of Germany the Finniſh nations are well known to have preceded the incurſions of the Goths and Slavons. The Scythians or Goths, proceeding from their original ſeats on the Euxine, expelled the Cimbri and Fins; and long before the light of hiſtory ariſes had planted colonies in the north of France, whence a part had paſſed to England, not to mention their ſouthern poſſeſſions in Gaul and Spain. The Goths on the Euxine, and the German nations, were the deſtroyers of the Roman empire in the weſt; and it is in vain with the weak authors of a fabulous age to trace their origin to Scandinavia, which in the claſſical period had only detached two colonies, the Jutes or Danes, and the Picts of Scotland.

Progreſſive Geography.

The progreſſive geography of Germany, though an intereſting topic, has never been ably illuſtrated; and the ancient is obſcure, for even D'Anville has been contented to follow the antiquated errors of Cluverius and Cellarius, men of plodding erudition, but deſtitute of judgment and ſagacity, and who have compoſed maps which have little relation with the grand and immoveable features of nature. It appears that the central parts of Germany were little known to the ancients.

* The recent changes in Germany will be indicated in a general article at the end, a plan conceived to be more clear and ſatisfactory than if they had been preſented in detached notes or fragments.

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The ſouthern and weſtern diſtricts, as bordering on the Roman empire, had been partially explored. Roman ſhips had navigated the Baltic, and Roman armies had viſited the northern courſe of the Elbe; but the centre and the eaſt, though filled by Ptolemy with many names, muſt be regarded as nearly unknown, ſince he errs ſo widely in the arrangement of mountains and rivers. It would appear that the Roman arms had penetrated nearly in a direction due eaſt, to the neareſt circuit of the Elbe near Magdeburg, in which quarter the trophies of Druſus were erected. On the S. the Sudetic mountains, and perhaps the Erzgeberg, ſeem to bound the knowledge of the ancients; while through the centre of Germany, from the Rhine to the Viſtula, extended the vaſt Hercinian foreſt, by Heſſia, Thuringia, and the north of the Sudetic and Carpathian mountains. The mountain Melebocus of Ptolemy ſeems to be the ſame with the Bructerus of others, repreſenting the moſt northern mountains of Germany thoſe of the Hartz; and the Semana Sylva may alſo be ſought near the courſe of the Roman army towards Magdeburg. There is reaſon to believe that Ptolemy, borrowing from various writers, often gives the ſame nation or tribe, under different names, and thus peoples ſpaces which would otherwiſe preſent a wide blank; ſo that the moſt authentic ſources of German geography are the writings of Pliny, Tacitus, and other hiſtorians. Progreſsive Geography.

The interior of this country remained unexplored till the age of Charlemagne, and the northern parts for ſome centuries after that period. Longer details would not be adapted to the limits of this work; but it appeared eſſential to indicate ſome radical errors in the claſſical geography of a country, whence moſt of the modern European nations have proceeded.

Hiſtorical Epochs.

Some of the grand hiſtorical epochs have already been mentioned, in deſcribing thoſe large portions of Germany, the Auſtrian and Pruſſian dominions; and ſome of the others may be briefly hinted in the account of the reſpective ſtates. Suffice it here to mention: 1. The ancient period, chiefly reſting on the account of the Roman and Francic hiſtorians. 2. The middle period. In the end of the eighth century, Charlemagne having ſubdued a great part of Germany* and

* Particularly the Saxons: the ſouthern parts had before been ſubject to the Franks, and were converted to Chriſtianity.

Historical Epochs.

Italy, was in the year 800 proclaimed Emperor of the Weſt. His ſucceſſor Louis le Debonnaire held the empire with France; but his ſon Lothaire I was reſtricted to Germany. After many inteſtine commotions Henry duke of Saxony was choſen emperor in 918, the line of Charlemagne having failed ſix years before. He was followed by his ſon Otho the Great, 936: and the line of Saxony failing in 1024, was followed by that of Franconia. In the twelfth century aroſe the factions of the Guelphs and Gibelines, the latter being the partiſans of the emperor. Frederic Barbaroſſa, who aſcended the imperial throne 1152, is a diſtinguiſhed name. Long conteſts having again ariſen, the ſcepter was at length aſſigned to the houſe of Auſtria in 1273; and after ſome deviations continued to remain in that family. 3. The modern period, which may be traced from Charles V; or from his grandfather Maximilian.

Antiquities.

The antiquities of Germany conſiſt chiefly of a few Roman remains in the S. and W. It would be endleſs to enumerate the churches founded by Charlemagne; or the numerous caſtles erected by powerful princes and barons.

Religion.

The religion of the greater part of Germany may be pronounced to be the reformed, firſt introduced into Saxony by Luther. Yet the ſouth continues firmly attached to the Roman Catholic faith, now chiefly ſupported by the houſe of Auſtria. The government is that of an ariſtocracy, which elects a monarch, who may be of any family, Catholic, Lutheran, or Calviniſt. To conſider the conſtitution at length, which has been called by a German writer "a confuſion ſupported by providence," would be foreign to the nature of this work; and indeed little intereſting, as being an antiquated and inefficacious ſyſtem, expected ſpeedily to ſink under the power of Pruſſia and Auſtria.* The work of Putter may be conſulted by thoſe who have patience to inveſtigate ſuch objects.

Population.
Army.

The population of Germany in general is computed at little more than 25,000,000. It was ſuppoſed that the empire could, if united, ſend forth a contingent army of 400,000; but ſuch calculations are viſionary in the preſent ſtate of affairs. The revenues, political importance and relations, are now detached, and have already been in a great part conſidered under the articles of Pruſſia and Auſtria. The

* It has ſince fallen.

manners, cuſtoms, and dialects, vary according to the different ſtates. Army. The Saxon is accounted the pureſt and moſt claſſical idiom of the German tongue; and the ſouthern dialects of Suabia, Bavaria, and Auſtria, the moſt uncouth. The literature will beſt be conſidered under each ſtate; to ſtyle an author a German being almoſt as vague as to call him an European, ſo diſtinct are the ſeveral ſtates and the ſhades of civilization. The roads in general are bad; and the poſtillions noted for inſolence and indolence. Moſt of the other topics can be illuſtrated with more preciſion in the account of ſuch ſtates as deſerve particular attention.

Language. Literature. Roads.

It will be remembered that in the deſcription of the Auſtrian and Pruſſian dominions are contained many of the eaſtern provinces of Germany. The part which remains is the weſtern half, naturally divided into two portions by the river Mayn. The remaining objects to be generally conſidered in this weſtern portion are chiefly the aſpect of the country, the rivers, lakes, mountains, and foreſts, with the botany and zoology: other topics being more appropriated to each ſtate.

To the north of the Mayn Germany chiefly preſents wide ſandy plains, which ſeem as if they had been, in the firſt ages of the world, overwhelmed by the ſea. A few hills begin to appear in the neighbourhood of Minden; and in the ſouth of the Hanoverian dominions ariſe the moſt northern mountains of Germany, thoſe of Blockſberg, and others in the Hartz. To the S. W. are the mountains of Heſſia, and others, extending towards the Rhine: while on the eaſt the rich and variegated country of Saxony, one of the moſt beautiful and fertile in the empire, extends to the ſouthern limits of the mountains of Erzgeberg, abundant in mines and ſingular foſſils.

Face of the Country.

The regions to the ſouth of the Mayn may be regarded as rather mountainous, while our maps repreſent Germany as one continued plain. Both portions are watered by numerous and important rivers. In the north the Elbe is the moſt diſtinguiſhed ſtream, riſing in the Sudetic mountains of Sileſia; and, after running ſouth for about 50 miles, it ſuddenly aſſumes its deſtination of N. W., receives the Bohemian Mulda and Eger, the Mulda and Sala of Saxony, and the large river

Rivers. Elbe.

Rivers. Havel from the eaſt, and enters the ſea near Cuxhaven, after a comparative courſe of more than 500 Britiſh miles. The chief cities on the banks of the Elbe are Dreſden, Meiſſen, Wittenburg, Magdeburg, from which it runs almoſt a ſolitary ſtream to Hamburg. The tide is perceived to the height of 22 miles; and, when raiſed by the north wind, middle ſized veſſels may arrive at Hamburg, but they are in general obliged to anchor a mile below the city.[1]

Not far to the weſt is the mouth of the Weſer, which firſt receives that name when its two ſources, the Werra and the Fulda, join near Munden in the principality of Calenburg, about 16 Britiſh miles S. W. of Gottingen. The Werra ſprings in the principality of Hildburghauſen; and the Fulda in the territories of the biſhopric ſo called; the former having the longeſt courſe, and being juſtly conſidered as the chief ſource of the Weſer, which thus flows about 270 Britiſh miles. The principal towns on this river are Bevern, Minden, and Bremen; the Rhine alone boaſting of numerous cities on its banks. The chief tributary ſtream is the Aller from the duchy of Brunſwick. The inundations of the Weſer are terrible, the adjacent towns and villages ſeeming to form iſlands in the ſea: hence the ſhores are eſteemed unhealthy.

Werra.

The Ems is an unimportant river, which riſes in the biſhopric of Munſter. The ſources and mouths of the Rhine have been already deſcribed. This noble river forms the grand ancient barrier between France and Germany; and its courſe may be computed at about 600 Britiſh miles. On the German ſide it is diverſified with mountains and rocks; but from Baſel to Spire the ſhores are flat and uninteresting.[2] Near Mentz they become rich, variegated, and grand; and on the confluence with the Mayn the waters are diſtinguiſhable for many leagues. The Rhinegau is not only celebrated for its wines, but for the romantic appearance of the country, the river running through wild rocks crowned with majeſtic caſtles. Hence as far as Bonn the ſhores abound with beautiful and ſtriking objects, the Rhine

Rhine.

[1] Buſching, vi. 16. but he forgets to inform us how far the Elbe is navigable by boats or barges. The Oder and Weichel or Viſtula have been deſcribed in the Pruſſian dominions.

[2] Gardner's Views on the Rhine.

not ſeeming to aſſume his grandeur till after his junction with the Mayn.[3] Rivers.

In the ſouthern part of Germany the moſt important river is the Danube, which according to the common opinion riſes near the little town of Doneſchingen in Suabia, and Count Marſigli has engraved the ſprings; but ſome place the ſources a little further to the north.* This noble river becomes navigable a little above Ulm, where it receives the Iler. The next tributary ſtream of conſequence is the Lech, which comes from Tyrol, a ſtream diſtinguiſhed in the ſeat of the recent war; as is the Iſer, proceeding from Upper Bavaria. The Danube runs about 250 miles through this part of Germany, paſſing by Ulm, Ratiſbon, and Paſſau. To Orſova it may be conſidered as an Auſtrian river for about 550 miles; thence it is Turkiſh for 480 to the Euxine. Danube.

The Necker is a tributary ſtream of the Rhine, riſing in the Black Foreſt, not far from the Danube, and running a picturesque courſe of about 150 Britiſh miles through a country variegated with vineyards. Another and grander tributary ſtream of the Rhine ſprings from the lake of Fichtel See, on the mountain of Fichtelberg, eſteemed among the moſt elevated parts of Germany, as it gives ſource to four rivers running in various directions, the Mayn to the W., the Eger to the E., the Sala to the N., and the Nab to the S. This ſource is called the White Mayn; while another ſource the Red Mayn, ſo called from the red clay through which it flows, riſes near Hærnleinſreuth, in the principality of Bareuth. The Mayn, after receiving the Rednitz and other conſiderable ſtreams, joins the Rhine to the S. of Mentz. The Mayn is a muddy ſtream, but abounds with trout, carp, and other fiſh. After pervading the rich biſhoprics of Bamberg and Wurtzburg, and ſome territories of the ſee of Mentz, it waters the walls of Frankfort, formerly a city of celebrated trade; and has recently acquired freſh importance from being conſidered by German politicians as a natural boundary between the power of Pruſſia in the N. of Germany, and that of Auſtria in the S. Necker. Mayn.

[3] Ib. Rieſbeck, iii. 261. obſerves that the hills extend to near Cologne; but lower than thoſe to the ſouth of Mentz. At Cologne end the dominions of the German Bacchus.

* The Brege is in fact the longer current, yet it is ſaid to fall into the Danube.

To

Lakes.

To the north of the Mayn Germany prefents few lakes, the largeft being in the duchy of Mecklenburg, where the lake of Plau extends under various names about 25 Britifh miles in length by 6 in breadth: that of Schwerin is about 18 miles in length, while that of Ratzburg is 15. Next is one in the county of Diepholtz, and another in the county of Mansfeldt in Upper Saxony. In the more fouthern and Alpine regions the Boden See, or lake of Conftance, is the moft diftinguifhed expanfe of water, already defcribed under Swifferland. Next is the Chiem See in Upper Bavaria, about 14 Britifh miles in length by five in breadth, fometimes largely ftyled the fea of Bavaria. That circle, like moft mountainous countries, alfo contains many other lakes of fmaller account.

Chiem See.

Mountains. Hartz.

The moft northern mountains in Germany are thofe of the Hartz, called the Brocken or Blockfberg.[4] Thefe mountains rife in the form of an amphitheatre, the higheft being what is called the great Blockfberg; which, (while the others are covered with pines and birch, thus uniting the ancient confufion of foreft and mountain,) only prefents white ftinted brufhwood: and the fnow fometimes remains till midfummer, and even longer in the northern cavities. On the fummit is a fmall hovel, a retreat for thofe who afcend. The river Ilfe rifes from the bottom; and other ftreams fpring from the hills to the N. W. and to the E., which afford many medical herbs. The height of the great Brocken is by the barometer 3021 feet; and the little Brocken 2713.

In Weftphalia there are fome hills near Minden;* and in the duchy of the fame name, bordering on Heffia, are the mountains of Winterberg, Aftenberg, Schlofsberg, and others.[5] The Heffian territories may be regarded as generally mountainous, efpecially towards the north. The range of Meifner contains a coal mine, under which is a bed of petrified wood.[6] To the north of Caffel are many high mountains, as the Stauffenberg, the fummit of which is called Bartelfpopf, and the

[4] Bufching, x. 251.

* Riefbeck, iii. 117, fays that he did not obferve one hill from Hamburg to Embden, nor from thence to Hanover; and in Weftphalia the heaths are more barren than thofe of Jutland.

[6] Bufch. viii. 8–9. *Berg* in German fignifies a mountain; and is rather a fuperfluous addition.

[5] Ib. 252.

Gameberg

Gameberg towards Munden. In the Heſſian territories are alſo the *bergs* of Doern, Behren, Schrecklen, Guden, Valken, all in the diſtrict of Zieremberg, with many in the S. E. of Felſberg; not to mention the hilly foreſt of Habichtſwald. On the S. of Gotha is the mountainous foreſt of Thuringia, the chief ſummits being the Inſelberg, of porphyry, 3127 feet above the ſea; and the Schneekopf 3313 feet. Thence S. W. towards the Rhine are ſeveral conſiderable hills, among which may be mentioned thoſe in the weſt of Wetterau, and the ſeven hills near the Rhine almoſt oppoſite to Andernach; with the ridge of Heyrich which protects the vines of Rhinegau. To the eaſt of Frankfort on the Mayn are the hilly foreſt of Speſſart, with the metallic heights of Fulda and Henneberg; and that river ſprings from the remarkable mountain of Fichtelberg, or the mountain of pines, nearly 22 Britiſh miles in length, and 16 in breadth, diverſified with deſarts, precipices, high rocks, and marſhes.[7] The ſummits have various names, the Ochſenkopf being reputed the higheſt. The lake called Fichtel See is in a cavity of this mountain, called the See Loh;* but is of little extent, being only remarkable as the ſource of the White Mayn. Other parts of this memorable mountain give riſe to the Eger, which runs to the E., and the Sala and Nab flowing to the N. and S.

Mountains.

Fichtelberg.

But the moſt celebrated mountains, in that part of Germany which lies to the N. of the Mayn, are the Erzgeberg, or Metallic Mountains, which riſe to the N. E. of the Fichtelberg, running between Bohemia and Saxony, but ſupplying both countries with ſilver, tin, and other metals. The Erzgeberg are not of remarkable height, yet contain much granite like thoſe of the Hartz and Heſſia; with gneiſs, in which moſt of the Saxon and Bohemian mines are found. Granular limeſtone alſo appears; and in Upper Luſatia an entire mountain is found of ſiliceous ſchiſtus, while Flinzberg conſiſts almoſt entirely of milk-white quartz.[8] Miſnia contains mountains of pitchſtone; and that

Erzgeberg.

[7] Buſching, ix. 171. Reckoning the German mile of fifteen to the degree, as nearly equal to four Britiſh. The French tranſlator of Buſching has been very careleſs in rendering the miles. Rieſbeck, iii. 165. deſcribes the Speſſart; and p. 199. the view from Alkoniger (about ten miles N. of Frankfort) extending about 50 miles in every direction.

* The German *Loh* or *Loch*, a cavity, is the parent of the Scotiſh Loch, a lake.

[8] Kirwan, Geol. Eſſ. 174-176.

ſtrong

Mountains.

ſtrong primeval ſubſtance called hornblend, which approaches to the nature of iron, is found in mighty ſtrata. In Voigtland, near Averbach, appears the famous topaz rock, conſiſting of pale topazes in hard lithomarga. Micaceous ſchiſtus and ſlate alſo form portions of the Saxon mountains; with large maſſes of trap and baſalt, often imbedded in the gneiſs, which likewiſe contains ſtrata of ſerpentine. Hornblend, ſlate, and ſandſtone, both calcareous and ſiliceous, alſo contribute to this noted chain. Thoſe of Heſſia preſent nearly the ſame opulence of primary and ſecondary ſubſtances: and a ſummit of the Meiſner, as already mentioned, conſiſts of baſalt reſting on coal. In the Hartz, granite alſo abounds; with porphyry, ſlate, and other primitive ſubſtances * The metals will be conſidered in the account of each country.

Bergſtraſs.

Among the German mountains to the S. of the Mayn may firſt be named the Bergſtraſs, a ridge paſſing from near Manheim to the vicinity of Frankfort, and accompanied by a high way commanding proſpects of wide extent. On the eaſt are the high hills of Odenwald.†

Wurtemberg.

Further to the S. are the mountains of Würtemburg, riſing both on the E. and W. of that extenſive duchy. On the W the mountains form a continuation of thoſe of the Black Foreſt, which hence proceeds ſouth to the Rhine, being the mount Abnoba of Tacitus, whence he juſtly derives the ſource of the Danube; and the Helvetian foreſt of

Black Foreſt.

Ptolemy. The mountains of the Black Foreſt, in German Schwarzwald, extend from near Neuenburg, in the territories of Würtemburg, ſouth to the four foreſt towns on the Rhine.[9] The ſouthern part is

* At Pohlberg in Saxony baſaltic columns reſt on gneiſs; and thoſe of Stolpe, in the ſame country, riſe without articulation to the amazing height of 300 feet. Kirwan, Geo. Eſſ. 248—250. In the valley of Plauen are ſeveral coal mines; and there is alſo coal in Halverſtadt, a country far to the N. W. Ib. 302-308.

† See the above picturesque paſſage of Rieſbeck, who ſays, that from the Alkoniger he ſaw, with the riſing ſun, the ſummits of Odenwald and Speſſart, appearing at a diſtance like iſles of fire, while the wide intermediate vale was in darkneſs. On the other hand the proſpect extended as far as Donneſberg, in the Palatinate.

[9] Buſching, viii. 481. In the *Journal de Phyſique*, New Series, vol. i. there is an intereſting journey of Sauſſure to examine ſome extinct volcanos in the Briſgau; and he concludes, p. 355, that volcanos certainly did exiſt in that country. While the mountains of Voſges are chiefly compoſed of porphyries, thoſe of Briſgau preſent petroſilex and granites in a ſtate of decompoſition. The higheſt ſummit of the Black Foreſt is Pelchen.

called

called the High, and the northern the Lower foreſt: the length being about 80 Britiſh miles. To the E. the Necker may be conſidered as a boundary; and the breadth may be computed at about 20 Britiſh miles. The eaſtern part as uſual, preſents a gradual elevation; while the weſtern ſhows precipitous ſummits to the inhabitants of Baden and Alſace. The appellation ſeems to ariſe from the thick dark foreſts with which the aſcents are cloathed. Beſides paſturage, the inhabitants (partly ruled by Baden, partly by Wurtemburg,) derive advantage from the roſin of the pines, and the timber, of which they make all kinds of utenſils. Some parts are cultivated by ſpreading branches of pine, covered with ſod, which being burnt an excellent manure prepares the ground for four abundant harveſts. A branch of the Black Mountains ſpreads E. from near Sulz on the Necker towards the county of Œtingen, being more than 60 miles in length. This chain is called the Alb, and ſometimes the Suabian Alps. Buſching traces this ridge from the N. E. extremity, the ſource of the Brenz, to the weſt of the Nereſheim, by Wiſenſteig, where the mountains are higheſt. Thence they turn N. W. to Guttenberg, and W. to Neiffen, whence they paſs by Hohenzollern to the Necker, then bend S. and W. between that river and the Danube. Buſching adds, that as this chain riſes inſenſibly at Konigſbronn N. E. ſo it gradually terminates at Ebingen S. W. The principal ſummits are in the N. and W. of the ridge; and the foreſts are chiefly beech, while the open ſpaces ſupply paſturage for numerous flocks of ſheep.

Mountains.

Alba.

Of theſe two extenſive ridges of mountains, the Black Foreſt, and the Alb, a conſiderable portion pervades the duchy of Wurtemburg; and near Stutgard, the capital, are the mountains of Boyſerſteig, Weinſteig, and Haſenſteig. The conſtituent parts of theſe extenſive ridges have been little detailed; but a great part is calcareous, as they ſupply excellent marbles. Near Frudenſtadt in the Black Mountains are mines of ſilver and copper.

The ſouth eaſt of this portion of Germany is bounded by the high mountains of Bavaria and Salzia or Salzburg; being branches or continuations of the Swiſs or Tyroleſe Alps, but without general appellations. Ferber ſays that the high mountains of Bavaria, bordering

Mountains. on Tyrol, are granite; thence, as usual, argillaceous and calcareous in the lower parts.[o] Large pieces of grass-green quartz are found studded with red transparent garnets, and at Munchen or Munich are worked nto elegant snuff boxes. Some hills near Regensburg, or Ratisbon, are calcareous; but towards Bohemia they consist of gneiss and granite. Of the Alps of Salzburg an account has been published by Vierthaler, whence it would seem that they exceed in height the Carpathian chain or the Pyrenees, and only yield to the Swiss and Tyrolese Alps. The highest summits are said to be the Sonnenblick, the Ankogel, the Wisbacher Horn, and the Loffler in the Stillupe. Even the next to these in height, the Hohe Nan, or the Hockhorn, is computed at 10,633 feet above the sea; and the Grosse Kogel in Rauris at 9,100; while several others exceed 8,000 feet. The mines of this country are celebrated; and in Zillarthal, or the vale of the river Ziller, on the west, is found the substance called Zillerthite by the French mineralogists.* The chief ridge of the Salzian Alps is on the S. and E. of the country, being an elongation of the grand chain, reaching from Mount Blanc and Mount Rosa along the north of Italy through Tyrol.

Forests. Considerable remains yet exist of the ancient forests which pervaded Germany. The German word *wald*, corresponding with the old English *weald*, denotes a forest; and such are found in the south of Mecklenburg, continued easterly in different parts of the Prussian dominions; but the timber of Dantzick is supplied by the navigation of the Vistula; and the sandy regions on the S. of the Baltic seem little adapted to vigorous vegetation. The chief forests appear always to have extended along the middle regions of Germany, from the N. W. towards the S. E. The Dromling wald is to the north of Magdeburg; but the Sollinger wald, the woody mountains of Hartz, the Luttenwald, the wide forest of Thuringia, may be said to be connected with the ancient forests of Silesia, hence extending far to the E. through the centre of Poland and Russia. More to the south, in this part of Germany, are the

[o] Tour in Italy, 329.

* The mountains of Zillerthall are chiefly of slate. Kirw. 183. But the gold is found in gneiss.

Speſſart foreſt, and others. In the portion ſouth of the Mayn the vaſt Black Foreſt, and the woods along the Alb, are continued by others in various parts of Bavaria. In general the paſſion among the grandees for the chace of the wild boar, and other pleaſures of hunting, has contributed greatly to the preſervation of the foreſts. FORESTS.

As Spain is diſtinguiſhed by its groves of cork trees and ilex, and Scandinavia by its fir woods, ſo is Germany remarkable for its deep and almoſt impenetrable foreſts of oak: not indeed that this is the invariable characteriſtic of the country, for in an empire of ſuch great extent, and of ſo varied a ſurface, it muſt needs happen that the native vegetable productions on the ſhore of the German ocean ſhould differ conſiderably from thoſe in the receſſes of the Black Foreſt or on the frontiers of Tyrol. There is however on the whole more uniformity than might be expected, and though perhaps few plants are abſolutely peculiar to Germany, yet the abundance of ſome ſpecies, and the abſence of others, forms a ſtriking feature in the natural hiſtory of the empire. Botany.

To begin then with the hedges and roadſides, as theſe are ſituations that impreſs on a traveller at leaſt the firſt, and probably the moſt durable idea of the flora of a country. It will be remarked that the *lilac* and *ſyringa*, which with us ſcarcely ever ſtray beyond the bounds of the ſhrubbery, are by no means of uncommon occurrence in the hedges of the north of Germany; the *cornel*, the *ſweet briar*, and *cinnamon roſe*, are alſo common. Of the ſmaller plants the principal are *leſſer honeywort; winter cherry; yellow ſtar of Bethlehem; evening primroſe;* and *coronilla varia.*

The paſtures and edges of woods afford ſeveral kinds of iris, eſpecially *Germanica*, *Sibirica* and *pumila*, *campanula bononienſis*, *viola mirabilis*, *gentiana Bavarica* and *ſpicata:* ſeveral umbelliferous plants, as *caucalis carnoſa*, and *Ligiſticum Peloponneſiacum*, and a number of bulbous rooted plants.

The vegetables of the woods and groves may be divided into the ſhrubby and herbaceous; to the firſt belong, beſides the common foreſt trees and ſhrubs of England, *branched elder; Daphne cneorum*, *prunus mahaleb*, *Meſpilus Germanica*, *roſa pendulina*, pendent roſe; *Geniſta Germanica*,

Botany. *Cytisus laburnum*, laburnum; and *Cytisus nigricans*. Of the latter the most worth notice are *Panicum Germanicum* and *miliaceum*, millet grass; *asclepias vincetoxicum*, *astrantia major* and *minor*, *convallaria maialis*, *verticillatum*, &c. lily of the valley, Solomon's seal; clustered hyacinth; martagon lily; *anthericum ramosum*; fraxinella; *asarum Europæum*, monkshood; *helleborus viridis*, hepatica; and *serapias rubra*.

The mountains being inferior in height to those of Swisserland, are destitute of many Alpine plants; among those which they do possess the following are the chief: *stipa pinnata*, feathergass; *Veronica latifolia*, *globularia vulgaris*, *cynoglossum Apenninum*, *androsace septentrionalis*; *Gentiana ciliata*, fringed gentian; *Campanula thyrsoidea*, *Sium Hippomarathrum*, *sedum cepæa*, *anemoue alpina*, and *arnica montana*.

A few plants also worthy of notice are met with in the cultivated fields and vineyards, such as *heliotropium europæum*, tournesol; *anagallis cærulea*, blue pempernel; *camphorosma Monspeliaca*, *Saponaria vaccaria*, and *dianthus Carthusianorum*, Carthusian pink.*

Zoology. The zoology of this western half of Germany corresponds so much with that of the Austrian and Prussian dominions, that little need be added. The German horses are generally more remarkable for weight than spirit. The German wild boar is of superior size; and those of Westphalia are in particular estimation. In the N. of Germany the lynx is sometimes seen; and the wolf is not unknown in the south.

* Roth, Flora Germanica—Schrader, Spicileg. Flor. Germ.

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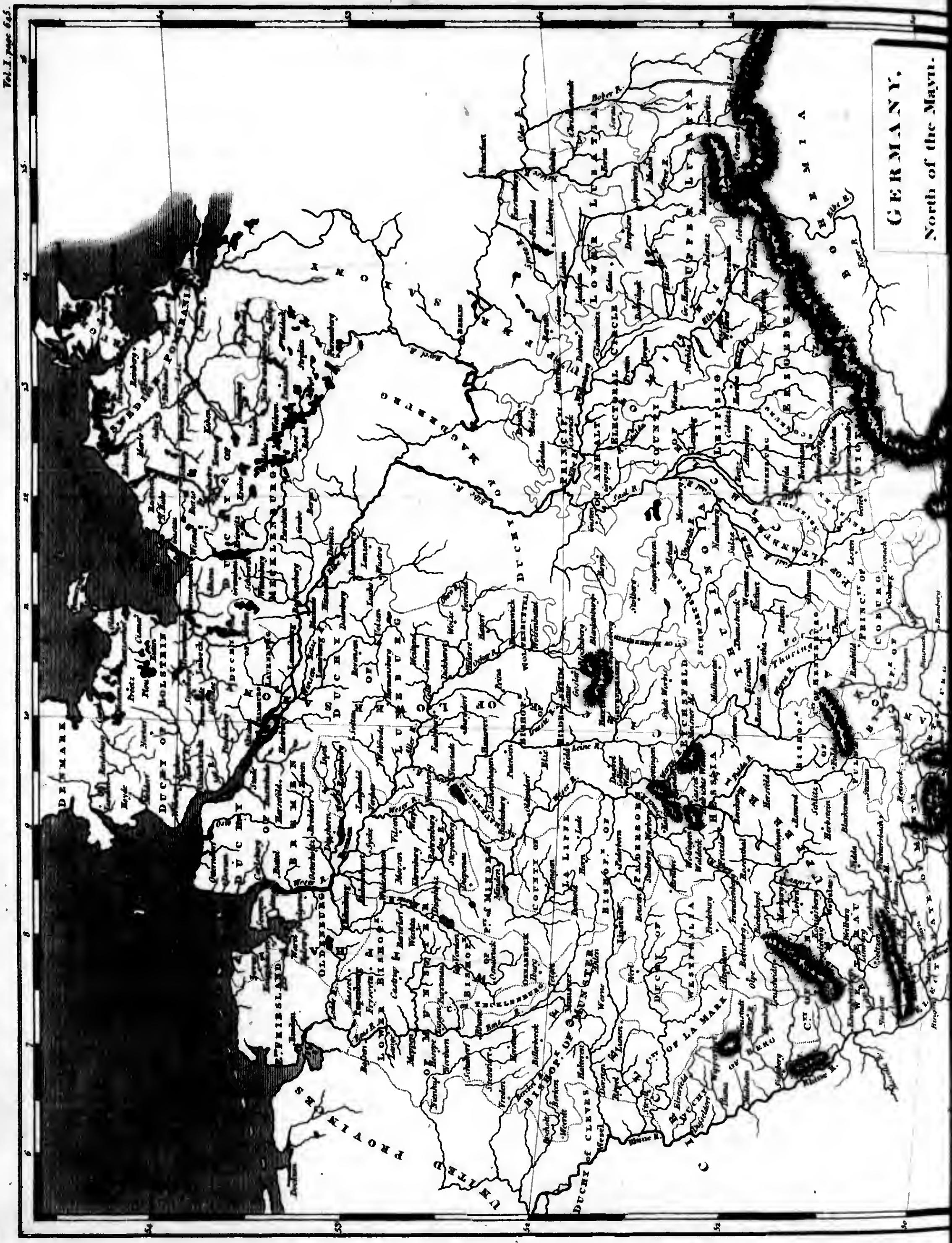

GERMANY,

North of the Mayn.

CHAPTER II.

THE CHIEF GERMAN STATES ON THE NORTH OF THE MAYN.

Saxony.—Brunſwick Lunenburg.—Heſſia.—Mecklenburg.—Duchy of Brunſwick.—City of Hamburg.—Smaller States.—Eccleſiaſtic Powers.

IN this diviſion of Germany the elector of Saxony muſt be regarded as the chief potentate, his territories being computed at 11,680 ſquare miles, the inhabitants at 1,896,000,* and the revenue at 1,283,333l. ſterling. The name is derived from the ancient nation of the Saxons, who in the middle ages held the greateſt part of the N. and W. of Germany, and extended themſelves thus far over Thuringia, towards the territories of the Luſitzi, a Slavonic tribe who gave name to Luſatia, and were repelled by Henry the Lion duke of Saxony in the twelfth century. It is not a little remarkable, as D'Anville[1] obſerves, that Witikind of Corvey, and Adam of Bremen, aſſert that the Saxons, with whoſe aſſiſtance Thieri king of Auſtraſia conquered Thuringia in 531, came from Great Britain, having landed at Hadeler between the Weſer and the Elbe. This tradition ſeems to have been preſerved by the people, as it is alſo reported by Eginhard, who had particular opportunities of information. Saxony. Name.

The countries compriſed in the electorate of Saxony are, the duchy ſo called in the north, and Voigtland in the ſouth; Luſatia in the eaſt, and part of Thuringia in the weſt; with part of Miſnia and Henneberg: being in length from E. to W. about 220 Britiſh miles, and in breadth from N. to S. about 130. The ancient dukes of Saxony ſprung from the kings who defended themſelves with ſuch valour Hiſtorical Epochs.

* In 1792, by Hoeck's calculation, there were 2,104,320: and the army 21,576 infantry and 6,180 cavalry, ſo as including other corps to form a total of 32,000. Revenue (A. D. 1800) 7,800,000 rix dollars.

[1] Etats formés, p. 20.

Saxony. against France. Otho III duke of Saxony became Emperor in 936, and resigned Saxony to the house of Stubenskorn or Billing, which ended in 1106; and soon after this potent dukedom passed by marriage to the house of Bavaria. Henry the Lion, duke of Saxony and Bavaria, 1139—1180, was of distinguished valour and power. In 1180 the eastern part of Saxony was assigned to Bernard of Ascania, the western half being given to the archbishop of Cologne. Wittenberg now became the usual residence. The house of Ascania ended with Albert III 1422; and was followed by that of Misnia. Ernest and Albert, sons of Frederic II, divided the territories in 1485, and formed two branches bearing their names. The Ernestine branch of the house of Misnia ruled till 1547, when John Frederic was deposed by Charles V, and the electorate assigned to Maurice of the Albertine branch, in which it continues. In order to gain the crown of Poland, the vain wish of the Saxon electors, Frederic Augustus, 1697, abjured the protestant religion; but neither he nor his successors have attempted to constrain the conscience of their subjects. The electorate suffered greatly by the invasion of the Prussians, in the war of seven years; but has since continued the tranquil and flourishing seat of arts and sciences.

Religion. The religion is the protestant, which was here introduced by Luther; and there are two bishoprics, Merseberg and Naumburg. The government is, as usual among the German princes, nearly absolute, but conducted with moderation through different councils. Yet there are states general of nobles, clergy, and burgesses, commonly assembled every sixth year to regulate the taxation; and Riesbeck regards the elector as a limited sovereign, as he can issue no laws without the consent of the states. Army, 24,000: and the political weight in this part of Germany next to that of Prussia, with which it is naturally connected, and which it cannot with safety oppose. This beautiful electorate may indeed well be an object of ambition to the Prussian monarchs; but the jealousy of other powers has prevented the conquest.

Literature. The language and literature of Saxony are the most distinguished in all Germany, most of the writers who have refined the language having been born, or having resided in this country, as Gottsched, who first introduced

introduced a ſuperior ſtyle, and many others. Leibnitz, Wolf, and other philoſophers were born or reſided in Saxony; among the artiſts may be named Mengs, Haſſe, and Luck. Leipſig is a celebrated mart of German literature. There are many ſchools, colleges, and academies; among the latter the mineralogic academy of Freyberg, inſtituted in 1765, is eſteemed the leading ſchool of that ſcience. Saxony.

The chief city is Dreſden on the Elbe, of celebrated neatneſs, and about 50,000 inhabitants; but often expoſed to the injuries of war.* It is firſt mentioned about the year 1020; and diſplays many manufactures, with the palace, and celebrated cabinets, of the elector. Leipſig has nearly 30,000 inhabitants. Wittenberg has ſuffered greatly by war, particularly in the ſiege by the Auſtrians in 1760; and it is now chiefly celebrated as having been the reſidence of Luther. Dreſden.

The manufactures of Saxony are thread, linen, laces, ribbons, velvets, carpets, paper, colours derived from various minerals, glaſs, and porcelain of remarkable beauty, and various works in ſerpentine ſtone. The country is alſo rich in native products, both agricultural and mineral; and beautiful pearls are found in the Elſter in ſhells about ſix inches long.[a] With ſuch advantages Saxony maintains a conſiderable inland commerce; and Leipſig is eſteemed one of the chief trading towns of Germany. Manufactures.

The climate is ſo favourable that wine is made in Miſnia. The face of the country, eſpecially towards the ſouth, is beautifully diverſified with hill and dale; and its richneſs between Meiſſen and Dreſden is eſteemed to rival that of the north of Italy. The land is well cultivated; the products, all kinds of grain and vegetables, with hops, flax, hemp, tobacco, ſaffron, madder, &c.† Chief rivers, the Elbe, the Saal or Sala, the Mulda, the Pleiſſe, the Elſter, with the Spree of Luſatia; all, except the Elbe and Sala, riſing in the mountains between Saxony and Bohemia. Face of the Country. Agriculture.

* Mrs. Radcliffe did not viſit Dreſden; but by her account the praiſes of the German cities are generally unjuſt, as they impreſs an Engliſh traveller with the conſtant idea of darkneſs, dirtineſs, and inconvenience.

[a] Buſching, ix. 352.

† See Hoeck's Tables for minute particulars.

The

SAXONY. The mountains are those of the Erzgeberg, already described in the general account of Germany; and there are several small forests, supplying fuel for the mines and domestic purposes. The botany and zoology are in general common with the rest of Germany; but the mineralogy is as usual particular, and few countries can boast of such fossil opulence.

Mineralogy. The mines of Johngeorgenstadt produce silver, tin, bismuth, manganese, cobalt, wolfram, &c. The other mines are those of Freyberg, Annaberg, Ehrenfriederstdorf, Altenberg, Eibenstock, Lauthenthal, Schneeberg, producing silver, copper, lead, and other metals. At Zwiknau is found the noted terra miraculosa; and at Schnekenstein, near Averbach in the Voigtland, appears the topaz rock, unique in its kind. The tin of Saxony is not only a rare product, but is excellent. Jet is also found; and abundance of fine porcelain clay, with fullers' earth, marble, slate, serpentine, agates, and jasper; but when Busching, and other geographers, add diamonds, jacinths, rubies, sapphires, and opals, they speak in mere ignorance, and only mean as usual limpid or coloured crystals.* The annual product of the silver mines has been computed, in the German style, at four tons of gold,† and is thought to be rivalled by that of the cobalt converted into smalt or a blue pigment. The tin, copper, lead, and iron, are also very productive. Nor must coal and turf be forgotten among the mineral productions of this remarkable region. Yet Saxony cannot boast of mineral waters: and the chief natural curiosities are, it is believed, to be sought in the mines.

HANOVER. Next in consequence is the electorate of Brunswick Lunenburg,‡ or, as often styled from the capital, the electorate of Hanover, containing about 8224 square miles, with 850,000 inhabitants, and the computed

* At Chemnitz in Saxony, black calcedony appears in porphyry.

In the lordship of Moscau, Upper Lusatia, a white earth is found of which the poor make bread. Buffon Min. iv. 224. It is singular that M. Humboldt, a Prussian, should have regarded the eating of earth as peculiar to South America.

† Or about 40,000l. In 1788 the product of all the mines was valued at 700,639 dollars. Hoeck.

‡ On the continent written and pronounced Lunéburg; the second *n* being added in English merely to give sound to the *e*. The original duchy was annexed to the city of Brunswick and castle of Luneburg, whence the conjunct title. Putter, vol. i. 220.

revenue

revenue 962,500l. sterling, while the military force is estimated at 20,000.* The various names of this country are wholly derived from the cities. It is situated in the circle of Lower Saxony, and possessed by the descendants of a branch of that great nation called the Ost Fali, or eastern Falians; while another branch to the west gave name to Westphalia. Hanover. Names.

The countries comprised in the electorate of Hanover are chiefly the duchy of Lunenburg, Bremen, and Verden, and Saxe Lauenburg adjacent to Holstein on the northern side of the Elbe; with the countries of Calenburg and Grubenhagen in the south, and those of Diepholtz and Hoya in the west, and that of Danneberg in the east. The southern territory of Grubenhagen is detached from the rest by the principality of Wolfenbuttel, the bishopric of Hildesheim, and the country of Halberstadt; the first being possessed by the duke of Brunswick, the second by its own bishop, and the third by the king of Prussia, having been transferred to the electoral house of Brandenburg by the treaty of Westphalia, 1648. Hence it may be computed that the compact part of the Hanoverian dominions extends in length, east to west, about 180 miles: and in breadth N. to S. about 100 miles; while the detached duchy of Grubenhagen, with southern Calenburg or the country of Gottingen, is about 80 miles in length by 30 in its greatest breadth. Extent.

The electors of Hanover spring from the ancient dukes of Brunswick. Bruno I, margrave of Saxony A. D. 955, enlarged and embellished the city of Brunswick. In 1071 the emperor Henry IV gave the duchy of Bavaria to Welph, son of Azo of Este, a powerful marquis in Italy, and of Cuniza, heiress of the first Welphs earls of Altorf in Suabia. His grandson, Henry duke of Bavaria, acquired Brunswick along with Saxony. In 1195 William, son of Henry the Lion, and of Matilda of England, acquired Luneburg: and his son Otho, 1213, was the first Duke of Brunswick and Luneburg. His son Albert I, 1252, was surnamed the great. Magnus II, 1368, was surnamed Torquatus, from a large chain which he wore. His son Ber- Historical Epochs.

* This army consumes most of the revenue. See Hoeck, who computes it at 25,970.

Hanover. nard retained Luneburg; while Brunſwick paſſed to Henry the ſecond ſon, and continued in his deſcendants till 1634. The dukes of Luneburg acquired ſome ſmall portions of adjacent territory. Henry being put to the ban of the empire in 1521, was ſucceeded by his ſon, who only aſſumed the title of duke of Zell, a ſtyle which continued till the reign of George William, 1665. In 1617 Chriſtian duke of Zell obtained poſſeſſion of Grubenhagen. In 1692 George William duke of Zell conſented that the electorate, inſtituted in favour of his family, ſhould be conferred on his younger brother, as he had no male heir. Erneſt died in 1698, having married Sophia daughter of Elizabeth, daughter of James I of England. He was ſucceeded by his ſon George Lewis, elector, 1698, and king of England, 1714. The later hiſtory of Hanover is little remarkable, except by repeated devaſtations of the French; and in the recent war it was only ſecured by the powerful interference of the king of Pruſſia.

Religion. The religion is the Lutheran: there are about 750 pariſh churches, with ſeven ſuperintendants. The government is now conducted by a council of regency, and there are provincial ſtates, though rarely ſummoned. The political importance of this electorate cannot be highly eſtimated in the preſent ſtate of German affairs; and from France or Pruſſia it can only be protected by the powerful mediation of England.

Political Importance.

Literature. The literature of this country has deſerved conſiderable applauſe, ſince the inſtitution of the univerſity of Gottingen by George II: it was founded in 1734, and ſolemnly opened 1737.

Hanover. The chief city is Hanover, in the northern part of the principality of Calenburg, ſituated on the river Leine, amidſt numerous gardens and villas. This city is firſt mentioned in the twelfth century; and is ſlightly fortified, containing about 15,500 inhabitants. In the new city, on the left of the Leine, is a library, particularly rich in books of hiſtory and politics. Gottingen ſtands on the ſame river, containing about 7,600 ſouls, a neat and pleaſing town, firſt mentioned in the thirteenth century. Verden, near the junction of Aller with the Weſer, is of ſmall account, but has recently ſent ſome veſſels to the Greenland fiſhery under

Gottingen.

under the Hanoverian flag. Other towns are Luneburg, which imparts its name to the electorate; Lauenburg, Zell, with Einbeck and Osterode in the province of Grubenhagen. HANOVER.

The manufactures and commerce of this electorate are pretty considerable, in metals from the Hartz, linen, cotton, some broad cloths, &c. The silver fabrics of Zell are celebrated in Germany. The chief exports are metals, coarse linens, timber, peat, with some cattle and grain.

The aspect of the country is plain, partaking somewhat of the sandy nature of Brandenburg, except in the south, where rise the lofty and picturesque mountains of the Hartz. The agricultural products are wheat, rye, barley, oats, peas, haricots, and pot-herbs of all kinds; with abundance of potatoes, good fruits, flax, hemp, tobacco, madder, &c. Wood abounds both for fuel and architecture, and affording considerable quantities of tar and pitch. Bees are particularly tended. Horses, cattle, and sheep are numerous; and game far from rare. Face of the Country. Agriculture.

The chief river is the Elbe towards the north; and the Weser and Leine on the west; with the Aller and Ilmenau in the centre. Smaller streams are the Loha, the Lutter, the Fuse, with the Siber which pervades the Hartzwald in the south. There are a few small lakes, as that of Diepholtz, and Stinhuder; but none equal in size to those in the adjacent province of Mecklenburg. The Hanoverian dominions contain many small forests, and woods, besides those of the Hartz, already described in the enumeration of the German mountains. Rivers.

The mineralogy is rich, consisting of silver, copper, lead, iron, cobalt, zinc; with marble, slate, coal, turf, and limestone, the last particularly from the hill of Kalkberg near Luneburg.* Two curious mineral substances, Mineralogy.

* In the year 968, the silver mines in the Hartz were first discovered, and worked by the command of the Emperor Otho the great. Boecler *Hist. Sæc.* ix. *et* x. who quotes *Sigebert, Dithmar, and Otho Frising.*

These mines seem therefore to be the very first that ever were opened in the north of Europe; and those of Saxony and Sweden may be regarded as filiations. The mines of Freyberg were discovered towards the end of the twelfth century, by a Hartz miner. *Journal des Mines*, No. 61, p. 64.

Jars, ii. 262, says that the mines of the Hartz were discovered in the tenth century by a hunter, who tied his horse to a tree, the animal striking with his feet, having disclosed the mineral. The rock

HANOVER. ſtances, boracite and ſtaurolite, are found, the former in the Kalkberg, the latter at Andreaſberg in the Hartz: which region likewiſe preſents ſeveral ſingular features of nature, as the cavern of Blackenburg, the termination of which has never been explored, and the cave of Hamelen.*

Having thus deſcribed, at ſome length, the two chief and leading principalities on the north of the Mayn, a few others, the next in power, may be briefly mentioned; for it would be a vain waſte of the reader's attention, and indeed only render his knowledge more confuſed and imperfect, if even ſhort accounts were attempted of the 300 princes and ſtates which crowd the labyrinth of Germany: princes whoſe territories under a monarchy would ſink into the geographical obſcurity of thoſe of a peer or landed gentleman; and ſtates which may be more aptly ſought in a gazetteer, or in the minute and laborious pages of Buſching, whoſe chorography of Germany is the moſt complete part of his work, and may be recommended to the reader who wiſhes for ample details.

HESSIA. In this ſecondary view of the north of Germany the firſt place muſt be aſſigned to Heſſia, a country of no mean extent nor fame. Some diſtricts, as uſual, being aſſigned to princes of the family, the ruling ſtate is denominated Heſſe Caſſel, ſo called from the capital. This territory is about eighty Britiſh miles in length, and nearly the ſame in breadth: miles ſquare, 2,760, with 750,000 inhabitants,† military force 12,000.

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rock is gneiſs. The noted mine of Idria was diſcovered in 1497 by a peaſant; and it would be difficult to name a mine in any part of the world which was not diſcovered by mere accident. A vein of quartz or ſpar commonly leads to a mineral, eſpecially if mixed with pyrites. Jars, iii. 197.

In Mr. Raſpe's tranſlation of Born's Travels, p. 234, is a curious note on the mountain of Blockſberg in the Hartz, which chiefly conſiſts of grey granite. From p. 239, it appears that the mountains between Saxony and Bohemia chiefly conſiſt of gneiſs, and argillaceous ſchiſtus.

* The biſhopric of Oſnabruck in Weſtphalia may be conſidered as an appanage of Hanover, adjoining to the county of Diepholtz. By the treaty of Oſnabruck, 1648, it was decided that this biſhopric ſhould be poſſeſſed alternately by a catholic and a proteſtant, the former at the choice of the chapter; but the latter always a prince of the houſe of Hanover, who was to have the civil and criminal ſuperiority; while the eccleſiaſtic affairs are adminiſtered by the archbiſhop of Cologne. Inhabitants about 120,000: revenue 26,250l.

† Hoeck ſays 700,184, including Heſs-Darmſtadt.

The

The derivation of Heſſi from the ancient Catti is arbitrary; and it is now conceived to originate from the river Eſſe, which runs into the Fulda: but this land was a ſeat of the ancient Cattians. NAMES.

This country is generally mountainous; but there are many pleaſant vales, ſometimes containing vineyards, and fields fertile in corn and paſturage. It abounds in game and fiſh, and there are many foſſils and minerals: the ſands of the Eder contain particles of gold; and there was formerly a mine of that metal, but of ſmall account, near Frankenberg. There are alſo found ſilver, copper, lead, alum, vitriol, coal, fine clays, with veins of marble and alabaſter, and ſome medicinal waters. Detached parts are watered by the Rhine and the Mayn; the ſmaller rivers are very numerous. Products.

There are ſtates of three orders, nobles, clergy, and burgeſſes from Caſſel, Marburg, and other towns. The religion is the reformed, with two or three ſuperintendants. The univerſities are thoſe of Marburg and Rinteln, and that of Gieſſen belonging to Heſſe Darmſtadt, ruled by another branch of the family. There is ſome trade from the natural products, and a few manufactures of linen, cloth, hats, ſtockings, &c. The chief city is Caſſel, which contains about 22,000 inhabitants, and is pleaſing, though often injured by war;* the Heſſians being more remarkable for expoſing their lives abroad, than for a vigorous defence of their native country. Hanau is alſo a conſiderable place; and the country ſo called is ſuppoſed to contain 100,000 ſouls.

The duchy of Mecklenburg is ſuppoſed to contain 4,800 ſquare miles, with 375,000 inhabitants, or by Hoeck's account 300,000. It is divided into two parts, known by the additions of Schwerin and Guſtro, full of lakes, heaths, and marſhes; and the ſoil being ſandy, produces little but rye and oats, yet many parts might be capable of MECKLENBURG.

* The artificial rivers and cataracts of the elector's country palace, Wilhelmſhohe, are the firſt in Europe. Two leagues from Darmſtadt is the Felſberg, called the ſea of ſtones, on account of the number of granite pillars, prepared by the Romans for ſome work. It is a fine grained light grey granite. *Note of Faujas.*

There are mines of ſilver and copper at Frankenberg, in Heſſia. Jars, iii. 87.

Buffon, Mineralogie, i. 484, 4to. informs us that in Heſſia, coal is found containing ſilver; and at Richenſtein, in Sileſia, gold is ſometimes found in the ſame ſubſtance.

great

MECKLENBURG. great improvement.* This country was long poſſeſſed by the Veneti, or Wends, being the furtheſt weſtern ſettlement of that Slavonic nation; and the peaſants remain in a ſtate of ſervitude, as was the caſe in Denmark, and many parts of Germany.

The ſtates, conſiſting of nobility and burgeſſes, are aſſembled yearly to regulate the taxation. The religion is the Lutheran, with ſix ſuperintendants; and an univerſity at Roſtock.

The manufactures are wool and tobacco; the exports, partly by Lubec partly by Hamburg, are grain, flax, hemp, hops, wax, honey, cattle, butter, cheeſe, fruits, feathers, dried geeſe, tallow, linſeed, wool, and timber. The ruling family deſcends from the old Venedic ſovereigns. The branch of Mecklenburg Strelitz began in the end of the ſeventeenth century, and enjoys Ratzburg, Stargard, and other provinces.

BRUNSWICK. The duke of Brunſwick poſſeſſes a territory of 1472 ſquare miles, with 170,000 inhabitants; the chief city being Brunſwick, which contains 22,000: but his territory is called the principality of Wolfenbuttel from a town of far leſs importance. This principality affords a ſpecimen of German geography, being itſelf enchaſed in the electorate of Hanover, while the biſhopric of Hildeſheim, and the country of Halberſtadt pervade the centre of Wolfenbuttel.

The duke of Brunſwick ſhares a part of the Hartz, and its important mines:† and the reſt of the country reſembles the electorate of Hanover. Here is a rich convent of Nuns at Ganderſheim of the Lutheran perſuaſion, the abbeſs being generally a princeſs of the family. There are ſeveral ſmall manufactures; and the ſtrong beer of Brunſwick, called mum, is exported from Hamburg. The electoral family, and the dukes of Brunſwick, alike ſpring from Magnus the pious 1463; but the laſting diviſion of the principalities of Brunſwick Luneburg, and

* Rieſbeck, iii. 69. obſerves that Mecklenburg is more diverſified with woods, lakes, &c. than Brandenburg, though there be no appearance of a hill in either. He ſays, ib. 123, that from Hamburg to Hanover almoſt the whole country is a deep ſand.

† Recently exchanged with Hanover for another diſtrict. The clear product of the mines of the Hartz is computed at 453,000 dollars. The dollar may in general be eſtimated at 3s. 4d., and the florin at 2s. Tables at the end of Putter, &c.

Brunſwick Wolfenbuttel, muſt be traced from the ſeventeenth century. The former branch having aſcended the Engliſh throne, the latter has ſince that event aſſumed the leading title of Brunſwick. BRUNSWICK.

Nor muſt the city of Hamburg be omitted, being after Vienna and Berlin, the third city in Germany, and ſuppoſed to contain 100,000 inhabitants, or by Hoeck's account 95,000; while no other, except Dreſden and Frankfort on the Mayn, contain more than 30,000. It was fortified by Charlemagne A. D. 808.* The Elbe is here, including the iſlands, near a mile broad; and, on the other ſide of the city, the Alſter forms a baſon chiefly uſed in parties of pleaſure. The houſes are rather commodious than elegant, and there are few fine ſtreets, the population being overcrowded on account of the fortifications, built in the old Dutch taſte, with ſpacious ramparts, planted with trees. It is ruled by a ſenate of 37 perſons, the form being ariſtocratic. The religion is the Lutheran, and including the territories the clergy amount to 53. There are conſiderable breweries, and works for refining ſugar, with ſome manufactures of cloth. Formerly the trade chiefly conſiſted of linens, woollens, wine, ſugar, coffee, ſpiceries, metals, tobacco, timber, leather, corn, dried fiſh, furs, &c.; but at preſent it is the great mart of the commerce of the Britiſh iſles with the continent. The bank was founded in 1619; and the numerous libraries do honour to the taſte of the inhabitants. Its chief dependencies are the river of Alſter, the bailliage of Ham, ſome iſles and lowlands on the Elbe; and, beſides ſome diſtricts acquired from Holſtein, the bailliage of Ritzebuttel, on the north of the duchy of Bremen, including the port of Cuxhaven, and the iſle called Neuewerk, ſituated oppoſite to that port.[2] HAMBURG.

Hamburg muſt now be regarded as the chief city of the Hanſeatic league, though that honour was formerly aſcribed to Lubeck. This celebrated league is one of the moſt remarkable phenomena in the hiſtory HANSEATIC LEAGUE.

* This city, with Lubeck and Bremen, alone retain the Hanſeatic league, founded 1241, and joined by a great number of cities, for the protection of their trade and commerce. This league declined in the end of the fifteenth century. Hamburg is ſuppoſed to be the third commercial city in Europe, and is certainly the firſt in Germany. By the Elbe and its tributary ſtreams it maintains a great inland commerce. See Nugent, i. 49.

From Lubeck, on the river Trave, about 900 veſſels ſail annually.

[2] Buſching, xi. 146-168.

of

Hanseatic League.

of Europe. During three centuries it was the firſt maritime power, dethroning the kings of Sweden and Denmark, and ruling paramount in the Baltic and German ſeas.

Towards the middle of the thirteenth century more than ſixty towns ſituated on the Rhine, entered into a perpetual alliance to defend themſelves againſt the tyranny of the nobles, and the general anarchy. The conſequence of this alliance was, that by united intereſts they formed as it were one *Hanſe* or Corporation, whence the name of the Hanſeatic league. Bremen and Lubeck, already celebrated for their commerce in the northern ſeas, ſoon acceded to the alliance, and were followed by Hamburg, ſeveral cities in Holland, and on the ſouth of the Baltic. In 1364 there was a ſolemn aſſembly of the deputies at Cologne, when the league was conſolidated by every art of policy, and even ſome inland cities were admitted to its participation. This ſingular republic, without any territory, waged ſucceſsful war againſt Denmark, and placed Albert of Mecklenburg upon the throne of Sweden. Norway fell into the vileſt ſubjection, and Bergen may be ſaid to have been garriſoned by the Hanſeatic league.

As the commodities brought from the Eaſt by the Venetians paſſed by Tyrol, Swiſſerland, Bavaria, and Swabia to the Rhine, the ſecurity of the highways became another object of the confederacy who contributed not a little to the civilization and improvement of Germany. One of the moſt important factories of the Hanſeatic league was at Bruges in Flanders; and another in London, where it ſtifled the induſtry of the nation. In 1551 it was proved, that this factory had exported forty-four thouſand pieces of broad cloth, while all the Engliſh merchants had only exported eleven hundred. Edward VI abrogated the privileges, which were reſtored by Mary, for it is in the very nature of the Catholic religion, by the ſtrict obſervance of ancient habits and practices, to cruſh all induſtry. Elizabeth burſt the chain, and lent the firſt ſpring to Engliſh commerce, afterwards widely diffuſed by the pacific ſkill of James I. In Scotland there was no factory, but the town of Bremen carried on a precarious trade with that country, amidſt repeated piracies and hoſtilities.

The

The league ſtill maintained ſome degree of vigour till the end of the ſixteenth century, but the rupture with England and independance of Holland were mortal blows to its preponderance, and in 1630, when a general aſſembly was ſummoned to Lubeck, none of the Hanſeatic towns ſent deputies except to notify their dereliction. Such was the fall of this unexampled confederacy which had often abuſed its advantages and repaid favour with inſult, but which greatly contributed to the diffuſion of commerce and the arts of civilization, boaſted an opulence ſuperior to that of monarchs, and imparted the firſt tincture of wealth and eaſe to the north of Europe, though its effects have ſtrangely eſcaped the notice of moſt hiſtorians. HANSEATIC LEAGUE.

At preſent the Hanſeatic League compriſes only three cities, Lubeck, Hamburg, and Bremen; and in the definitive treaty of indemnities, 25th February 1803, they are acknowledged as Hanſeatic cities, with the guarantee of their juriſdiction and perpetual neutrality.*

In this northern half of Germany are alſo Oldenburg, now a detached principality, poſſeſſed by 75,000 inhabitants; Swediſh Pomerania, 103,000; the principality of Anhalt, 100,000; the territories of the princes of Naſſau, 130,000; of the princes of Schwarzburg in Thuringia, 100,000; the princes of Waldeck, on the north of Heſſia, 80,000; the counts of Lippe in Weſtphalia, 95,000; the counts of Reuſs in Vogtland,† which they ſhare with the elector of Saxony, 66,000; and the city of Frankfort on the Mayn 36,000.‡ SMALLER STATES.

The

* De la Ligue Hanſeatique, par Mallet, Geneve, 1805, 8vo. This new work, by the author of the Hiſtory of Denmark, is worthy of his former reputation, but a more ample hiſtory is wanted. In German there is one by Sartorius, 1802, 3 vols.

† Or the *terra advocatorum*, ſo called from an office in the empire, which began in the tenth and ended in the fourteenth century, being hereditary in the family of Reuſs. Buſching, x. 267.

‡ Theſe numbers are now increaſed as appears from Hoeck, who adds that the imperial city of Bremen has now 40,000 inhabitants, and Lubeck 30,000.

The town of *Papenburg*, which has of late been ſo frequently mentioned, and which is not to be found in the books of Geography, is ſituated on the ſouthern frontier of the principality of Eaſt Frieſland, and the northern frontier of the county of Munſter, to the eaſtward of the Ems, and about 24 B. miles to the ſouth of Embden; and conſequently lies, the greateſt part, in the Pruſſian territory, and the ſmalleſt in that of Munſter. It belongs to the Baron of Landſberg Veelen. One hundred and twenty-four years ago, this ſpot was a marſhy waſte. One of the anceſtors of the preſent proprietor reſolved to ſettle a colony there, for the purpoſe of making turf. He accordingly dug

Ecclesiastic Powers.

The other chief powers were ecclesiastic: 1. The elector of Mentz the first in the empire, has lost his capital city, and Worms on the left bank of the Rhine; but he also held a large territory on the Mayn, with Erfuit a city of 15,000 inhabitants in the northern region of Thuringia, and the surrounding domain. 2. The elector of Triers, or Treves, whose extensive dominions, being chiefly on the left of the Rhine, are seized by the French. 3. The elector of Cologne, whose territories are chiefly in the like predicament, but who possessed the province called the duchy of Westphalia. 4. In Westphalia were the bishoprics of Munster, of Osnabruck, and Paderborn; the rich bishopric of Liege is immerged in the French conquests. 5. In Lower Saxony that of Hildesheim. 6. In the Upper Rhine that of Fulda and 7. the large bishopric of Wurtzburg, in Franconia, was chiefly on the north of the Mayn. The ecclesiastical electorates were computed each at more than 300,000 inhabitants; and the bishoprics from that of Hildesheim, the smallest, 70,000, to Wurtzburg 200,000. These extensive fees, founded and enlarged by the policy of Charlemagne and his successors, partly for the more speedy and effectual conversion of the pagans in the north of Germany, and partly to balance the rising power of the aristocracy, which afterwards proved so ruinous to the empire, have been recently secularized.

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dug a navigable canal from the Ems to the place now called Papenburg, and an abundance of people immediately flocked to inhabit this country. The town contains, at present, two churches, 400 houses, and 3000 souls. It possesses 160 vessels, the largest carrying 160 lasts, and about 100 small craft, which carry turf to East Friesland, Jever, Bremen, and Hamburg. There are 19 yards for ship building, in each of which, 12 or 13 carpenters are employed. See Rochette's map of Germany.

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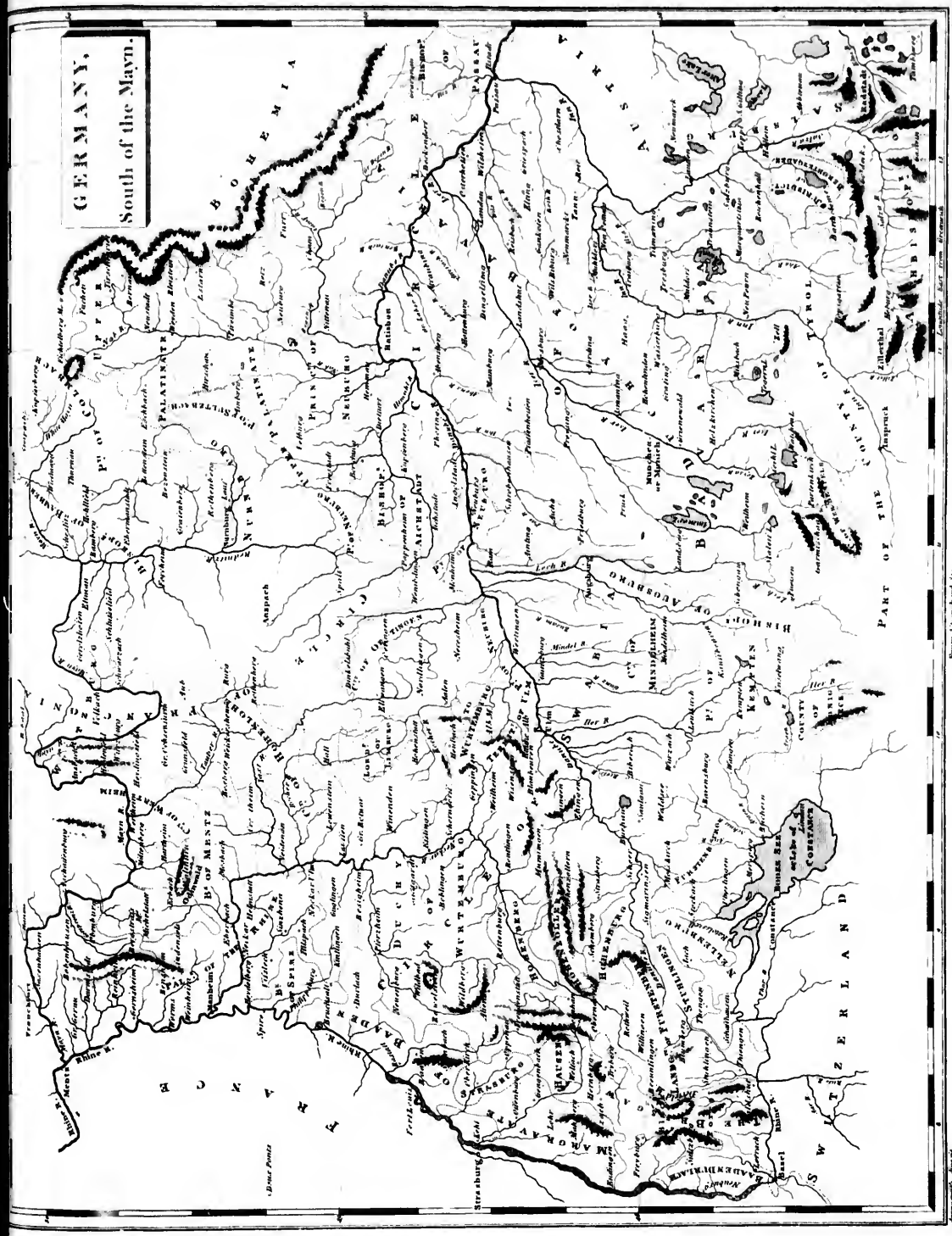

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CHAPTER III.

THE GERMAN STATES ON THE SOUTH OF THE MAYN.

Electorate of Bavaria conjoined with the Palatinate.—Duchy of Wurtemburg.—Anspach.—Salzia.—Smaller States.—Ecclesiastic powers.

AS in the northern division of Germany there are, exclusive of the Prussian dominions, two preponderating powers, the Electors of Saxony and Hanover; so in the southern division, exclusive of Austria, there are two superior potentates, the Elector Palatine and of Bavaria (these electorates being now conjoined), and the duke of Wurtemburg.

BAVARIA AND PALATINATE.

The elector of Bavaria and the Palatinate is the chief of all these secondary powers, his dominions being computed at 16,176 miles square, with 1,934,000 inhabitants;* while those of the duke of Wurtemburg yield as much to those of the elector of Hanover. The French having seized more than half of the Palatinate on the left bank of the Rhine,† a mountainous region but abounding in mines of quicksilver, and other valuable metals, the remaining part, on the right bank of the river, is about twenty-four British miles in length, by the same at its utmost breadth; but contains the best part of the principality, pervaded by the river Neckar, producing excellent wines, and enriched by the cities of Manheim, and Heidelberg.

Palatinate.

Extent.

Historical Epochs.

The first palatine of the Rhine was Eberhard of Franconia, A. D. 925. The Lutheran religion was established in 1556; and in 1563 appeared the famous catechism of Heidelberg: but since 1685 the Catholic system has predominated. In the thirteenth century the house of Bavaria

* Hoeck computes Bavaria at 1,339,900, the Palatine at 305,000.

† The elector Palatine has also lost the duchy of Julich, or Juliers. Yet he retained the duchy of Berg, on the right bank of the Rhine, with its noted capital Dusseldorf. Hoeck computes Julich at 192,217; Berg, 261,504 souls. See Render's Tour in Germany, 1801, 2 vols. ii. 137.

PALATINATE.

acquired the Palatinate by marriage, and from it the modern family descended. Frederick V, Elector Palatine, 1610, married Elizabeth daughter of James I of England; and aspired to the crown of Bohemia, but was vanquished, and the electorate transferred to the house of Bavaria. Yet by the treaty of Westphalia, 1648, his son regained a part of his dominions, and was created an eighth Elector of the empire. This branch failing in 1685, was succeeded by the collateral branch of Deux Ponts. Wolfgang of Deux Ponts left two sons, Philip and John, the first being the source of the new Palatine dynasty, and the other of the house of Deux Ponts. In 1693 the Palatinate was rendered almost a desert by the notorious ravages of the French. The Palatinate and Bavaria have recently been inherited by the branch of Deux Ponts, the son of the elector being now nominal duke of Deux Ponts.*

BAVARIA. Historical Epochs.

The history of Bavaria is yet more important. This country was governed by dukes, under the kings of Austrasia; and in the ninth century princes of the Francic family assumed the style of Kings of Bavaria, while Liutpold, 889, was the first duke; and his progeny extend to the present day, though interrupted in 946, when, Berthold dying without children, the emperor Otho gave Bavaria to his brother Henry of Saxony. In 1071 Welph, son of Azo of Este, became duke of Bavaria; which in 1138 passed to the house of Austria, but in 1154 returned to the house of Welph, in the person of Henry the Lion. In 1180 it finally returned to the first family, by the succession of Otho of Wittelbach, a descendant of Arnolf, second duke of Bavaria, after

* In 1385, Everard, last earl of Deux Ponts, sold the reversion of his domain to the Palatine family. In 1444 it was united with Veldenz. Thus the family of Deux Ponts also spring from that of Bavaria, whose source is Otho of Wittelback, who obtained the Duchy 1180, on the proscription of Henry the Lion, duke of Saxony and Bavaria. Otho, earl of Wittelbach, (a castle in the duchy of Bavaria near Aicha, on the Paar, which runs into the Danube to the east of Ingoldstadt,) was descended, in the eighth degree, from Arnolf earl of Scheyren, second son of Arnolf the bad, the second duke of Bavaria, A. D. 907, son of Liutpold the first duke, whose origin has not been ascertained, though the stock of royal families; for in 1654 Christina, the last of the house of Vasa, transferred the Swedish crown to Charles duke of Deux Ponts, her cousin, his father having married Catherine daughter of Charles IX of Sweden. Of this family were Charles XI and XII; and Ulrica who married Frederic prince of Hessia, afterwards king of Sweden; followed in 1751 by the present family of Holstein, sprung from the royal Danish house of Oldenburg.

the family had been unjuſtly deprived for more than two centuries. The emperors Lewis 1314, and Charles VII, 1740, were of this family. BAVARIA.

The duchy of Bavaria is divided into Upper and Lower, and what is called the Higher Palatinate (or that of Bavaria). The length from N. to S. is ſomewhat interrupted, but may be about 150 Britiſh miles, and the breadth about 120. Upper Bavaria is, in a great degree, mountainous; and covered with foreſts, interſperſed with large and ſmall lakes. Lower Bavaria is more plain and fertile. Extent.

There are mines of ſilver and copper near Podenmais, in the bailliage of Viechtach, and of lead at Reichenthal, with many quarries of marble, and mineral ſprings. But the chief mineral riches of Bavaria conſiſt in the ſalt ſprings at Traunſtein, which pervade mountains of ſaline earth, like thoſe at Hallen in the archbiſhopric of Salzburg, and occupy many people in productive induſtry. There are other ſprings at Reichenthal.[4] The mountains of Upper Bavaria may be conſidered as branches of the Alps. The chief rivers are the Danube, the Inn, the Iſer, the Lech, and the Nab; and in the Palatinate the Necker. Mineralogy.

The religion is the Roman Catholic, which, as uſual, damps the ſpirit of induſtry; and the manufactures are of ſmall account, the chief exports being corn and cattle. The revenue is computed at 1,166,600l.; and the military force at 12,000: both being greatly inferior to the ſmaller electorate of Saxony. Revenue.

The chief city is Munich, eſteemed the moſt elegant in Germany, with 38,000 inhabitants; in Lower Bavaria are Landſhut and Strauben. Ratiſbon, or Regenſburgh, *Regina*, though ſeized by the elector of Bavaria, 1703, is regarded as a free and Imperial city. In the palatinate of the Rhine is Manheim, ſuppoſed to hold 24,000 inhabitants; and Heidelberg, noted for wines, and a capacious tun, and formerly for a valuable library transferred to the Vatican. This city, amidſt the infamous deſtruction of the Palatinate, was reduced to mere walls, but afterwards reſtored by the induſtrious Lutherans. Munich. Manheim.

[4] Voyage d'un Français aux ſalines de Bavière et de Salzbourg en 1776. Paris an V.; the author is Barbé Marbois.

For the zoology of Bavaria the *Fauna Boica* may be conſulted. The Boii were ancient inhabitants of this country, and the *Hiſtoria Boiorum* of Aventinus is a hiſtory of Bavaria.

The

BAVARIA. The Bavarians are little diſtinguiſhed in literature; but are a vigorous race adapted to the fatigues of war. There is however an univerſity at Ingolſtadt, and an academy of ſciences at Munich. The ſtates conſiſt, as uſual, of clergy, nobility, and burgeſſes; but before the acceſſion of the houſe of Deux Ponts, the adminiſtration had become the moſt lethargic of any in Germany.* Hence its political importance has in ſome meaſure declined: and in the dangerous ſituation between France and Auſtria, it may be difficult for this power long to preſerve a ſhadow of independance.

Political Importance.

WURTEMBURG. The ſecond potentate in the ſouth is the duke of Wurtemburg, whoſe dominions are computed at 3,200 ſquare miles, with 600,000 inhabitants. This duchy derives its name from the caſtle of Wurtemburg, ſituated in the bailliage of Canſtadt. There were earls of Wurtemburg in the twelfth century; and in 1495 the ducal title was conferred on earl Everard. In caſe of the extinction of the family, the houſe of Auſtria pretends to the ſucceſſion, and even now aſſumes the title and arms of Wurtemburg. The dukedom of Teck was added in the fourteenth century.

Name.

The revenue is computed at 245,000l., the military force at 6000. This duchy forms the moſt conſiderable and fertile part of the circle of Suabia; and is indeed, after Saxony, one of the beſt in the empire. The mountains of the Black Foreſt on the weſt, and thoſe of the Alb on the S. and E., not only diverſify the face of the country, but ſupply timber, fuel, and mines. The chief grain is ſpelt, and ſome barley, and wheat, with flax, lint, &c. and the fertility ſuffices even for export. The wines of the Neckar are not ſo abundant as to prevent the uſe of cyder.

Products.

Mineralogy. There are mines of ſilver and copper near Freudenſtadt, and at Konigſwart; of ſilver at Konigſtein; and of copper at Guttach, near Hornberg. Iron is alſo found, but was chiefly brought from mont Beliard, now perhaps loſt in the French acquiſitions. Cobalt, ſulphur, coal, porcelain clay, marble, alabaſter, black amber, or rather obſidian, from the Alb, with the ſalt works at Sulz, conſtitute the other mineral

* By the accounts of Rieſbeck, and others, the government of the Palatinate of the Rhine, while detached, was miſerable.

 productions.

productions.* There are many warm baths and medical ſprings, and the chief river is the Neckar, which, with the Nagold, and its other tributary ſtreams, enlivens and fertiliſes the duchy. WURTEMBURG.

The ſtates conſiſt of fourteen ſuperior clergy, and the deputies of ſixty-eight towns and bailliages. The religion is the Lutheran, with ſome Calviniſts, and ſome colonies of the Vaudois. The church is ruled by four ſuperintendants, who are ſtyled abbots, and thirty-eight rural deans: a ſynod is annually held in the autumn. Education, and eccleſiaſtical ſtudies in particular, are favoured by laudable inſtitutions, not to be found in any other proteſtant country. The ſeminary of Tubingen uſed to contain about 300 ſtudents; and there is an academy of education at Stutgard. States. Education.

There are manufactures of pottery, glaſs, woollen, linen, and ſilk; which, with the natural products of the country, ſupply a conſiderable export: the imports are by Frankfort on the Mayn. The chief city is Stutgard, agreeably ſituated on a rivulet which flows into the Neckar, and the ducal reſidence ſince the year 1321. Some of the buildings are elegant, and there is a cabinet of natural and artificial curioſities. It has not recently ſuffered much from war, but was greatly injured by a conflagration in 1761. The ſecond town is Tubingen on the Neckar, with an univerſity founded in 1477. The other towns are ſmall but numerous, and the villages thickly placed in a populous and flouriſhing country.† Manufactures. Stutgard.

Among

* There is a remarkable cavern at Pfulingen, and another in the Albian mountains. They are here called *locks*, or *lochs*. Keyſler, i. 116.

† M. Abeil, ambaſſador from the duke, now king of Wurtemberg, at Paris, was ſo good as to communicate to me the following obſervations, here tranſlated from the French original:

1. "The new map of Suabia, in which the mountains are accurately repreſented, is publiſhed at Tubingen by Cotta.

2. "The work which treats of the Roman and other antiquities, of which veſtiges are found in the duchy of Wurtemberg, is entitled 'A Deſcription of the Country of Wurtemberg,' by M. Satler, keeper of the ducal archives, 4to, 1760–64.

3. "About twenty years ago the ground was opened near Koengen, at the diſtance of two or three leagues from Stutgard, and there were found on a hill, which commands the river Neckar, the ruins of a Roman camp or ſtation. A Roman road, which runs along the precipice, was diſcovered at about the diſtance of eight hundred or a thouſand feet; and along it ruins of a line of houſes which ſeemed to have been deſtroyed by fire. Among theſe houſes, of which the ground

ANSPACH. Among the ſecondary powers, in this ſouthern diviſion of Germany, muſt firſt be named Anſpach, or Onolſbach, which, with Bareuth, maintains a population of 320,000 on 2,320 ſquare miles. Theſe regions are mountainous and ſandy; but near the Mayn yield good wine. The chief mines are of iron, the others being neglected. Near the Fichtelberg, Bareuth produces a variety of beautiful marbles, and ſome curious minerals. The principality of Bareuth is alſo known by the name of Culmbach; and, with Onolſbach, formed the chief power in Franconia, lately reſigned by the ſovereign of Pruſſia.*

Salzia. The country of the Salz, alſo called Salzia, and the archbiſhopric of Salzburg, is a compact and intereſting region, about 100 Engliſh miles in length, and 60 at its greateſt breadth; computed at 2,880 ſquare miles, and a population of 250,000; by Hoeck's account, only 200,000. The archbiſhop is primate of all Germany, the ſee being founded by St. Rupert, an Engliſhman, in 716.[6] The chapter conſiſts of twenty-four perſons, of noble extract; and the houſe of Auſtria has contrived that a great majority ſhould be from her domains. No tax can be impoſed without the conſent of the provincial ſtates, compoſed

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ground floor is generally pretty entire, a pul [illegible] is obſervable. The houſes diſcloſed may amount to thirty or forty; and there have been found ſeveral pretty little ſtatues of bronze, among others a Mercury in a good ſtyle; a conſiderable number of beautiful earthen veſſels, great and ſmall; many female ornaments, as bracelets, &c. and no ſmall quantity of coins. Theſe curious relics were preſerved in the apartments of the caſtle of Koengen, but I am not ſure if they have ſince been tranſported to Stutgard, where there is a cabinet of antiquities. Since the war theſe reſearches have been abandoned; and perhaps theſe curious remains have been demoliſhed by the peaſants.

4. "The great Roman road, of which the veſtiges appear in the Electoral Foreſt, five leagues from Munich, paſſed from Tyrol (Kufſtein) to Augſburg (Auguſta Vindelicorum). In that foreſt ſome parts exiſt of conſiderable extent, elevated about eight feet above the level of the ground, and compoſed of earth and pebbles. The breadth, as far as I can recollect, may be about twenty feet; and from diſtance to diſtance there are ſemicircles of a conſiderable ſize, perhaps places where the carriages might ſtop, or rather where ſoldiers might draw up for their defence."

* In the caverns of Bareuth bones of carnivorous animals have been found, which ſome ſuppoſe to be of an unknown ſpecies. It is ſurpriſing that they eſcaped the notice of Faujas in his *Eſſai de Geologie*. See Playfair's ingenious Illuſtrations of the Huttonian Syſtem, p. 460.

[6] Putter, i. 44. Buſching, &c. St. Boniface afterwards founded many biſhoprics in the ſouth of Germany. Columban and Gallus were the apoſtles in Swabia. Kilien in Franconia, Wilibrod in Friſia, were all from England and Ireland.

of

of clergy, nobility and burgeſſes, the deputies being at the ſame time the tax-gatherers.[7] In political affairs this ſee is wholly ruled by Auſtria, there being twenty-two Auſtrians in the chapter. The chief ſuffragans are the biſhops of Chiem; of Gürck, and Lavant, in Carinthia; and Seckau, in Stiria; who all ſwear fidelity to the archbiſhopric, which poſſeſſes many fair lordſhips in Auſtria, Stiria, and Carinthia. SALZIA.

Salzburg, the ancient Juvavum, has an univerſity, with about 20,000 inhabitants; the other towns being of little moment. The Roman Catholic ſyſtem has baniſhed many induſtrious inhabitants, who have chiefly taken refuge in the Pruſſian dominions. The ſalt works at Hallen, about twelve miles S. of Salzburg, are very lucrative. They are in the mountain of Durenburg, which is excavated in galleries, occaſionally filled with water, till it be impregnated with ſaline particles.[8] There are alſo in Salzia ſome mines of ſilver and lead; and one of gold at Gaſtein, and others along the northern ſide of the Alps to Zillarthal, ſo that the archbiſhopric is ſuppoſed by Bergman to yield only to Hungary in the production of this precious metal. The copper is often impregnated with gold, which uſed to be a ſource of gain to the melters of Nurenburg. It is ſaid that emeralds and beryls are here found in micaceous ſchiſtus. Among the minerals may alſo be named the *bitter ſpath*, or muriatic ſpar, ſteatite, ſerpentine, talc, lapis ollaris, aſbeſtos, actinote, ſappare, and thallite, or green ſchorl. The aſparagite of Werner is only found in Zillarthal in talc of a greeniſh white. There are mineral waters in the vale of Groſſarl, from a calcareous ſource as uſual; but it is ſingular that the warm baths of Wildvad, in the valley of Gaſtein, proceed from rocks of granite and gneiſs.[9] Salzburg. Mineralogy.

This grand ſouthern diviſion of Germany alſo contains the territories of the Margraves, now Electors, of Baden, 832 ſquare miles, with 200,000 inhabitants; the lands of Heſſe Darmſtadt, belonging to another reigning branch of the houſe of Heſſia, reſiding at Darmſtadt, . d alſo poſſeſſing territories on the northern ſide of the Mayn, both eſti- Smaller States.

[7] Barbé-Marbois, p. 101.
[8] Journ. des Mines, No. 47.
[9] Ib. 60. 73.

Smaller States.

mated under the article of Heſſia. The imperial city of Nuremburg has conſiderably declined, but it ſtill contains about 30,000 ſouls, while Ulm has not above half the number. Auſtria enjoyed many extenſive territories in Suabia, ſome even bordering on the Rhine, and ſeveral on both ſides of the Danube: and theſe detached provinces were abſurdly ſtyled Further Auſtria. Among the ſmaller ſecular territories in that circle, may be named thoſe of the houſe of Truchſeſs, ſo called as being hereditary cup-bearers of the empire, and otherwiſe ſtyled counts of Waldburg. The counts Fugger, deſcended from the ancient opulent merchants of that name, poſſeſs eſtates on the weſt of the Lech. To enumerate other ſmall ſecular principalities would only obſtruct the intention of this deſcription, which is to impreſs on the memory the more important, which can alone claim notice in the page of hiſtory; while the ſmaller princes may indeed be named as generals, but their territories are beneath the notice of univerſal geography, and have as little claim to hiſtorical regard, as the eſtates of peers under a monarchy.

Eccleſiaſtic Powers.

But as the ſecularization of the numerous and wide eccleſiaſtical territories in Germany has engaged much political conſideration, it is proper to add here, as has been done in the former chapter, a liſt of the chief ſees to the ſouth of the Mayn. 1. The archbiſhopric of Salzburg, being among the leading powers, has been already deſcribed. 2. The large biſhopric of Wurtzburg, being chiefly on the north of the Mayn, has been mentioned in the former chapter: the next in importance, but often held in conjunction with the former, was that of Bamburg, ſuppoſed to contain 180,000 inhabitants. 4. The biſhopric of Speyr, or by the French enunciation Spire, was ſuppoſed to contain 50,000, but of theſe probably one half, on the weſt bank of the Rhine, are now ſubject to France. 5. The biſhopric of Aichſtett in the ſouthern extremity of Franconia. 6. Suabia preſented the large and opulent biſhopric of Augſburg, with an extent of territory about ſeventy Engliſh miles in length, but the medial breadth not exceeding twelve. 7. Of Conſtance, whoſe territories alſo extend into Swiſſerland. 8. A great part of the biſhopric of Straſburg. 9. The large abbatial territories of Kempten, Buchau, and Lindau; with the priory of Ellwangen in the north. 10. The

The bishopric of Passau, in Bavaria, was computed at 25,000 inhabitants. 11. That of Freysingen, with the county of Werdenfels, near the Rhætian Alps, at 23,000. 12. The bishopric of Ratisbon, which is of small extent. The chapters of Mentz, Wurtzburg, and Luttich, or Liege, preserved some appearance of freedom; while the others were chiefly influenced by the power of Austria. ECCLESIASTIC POWERS.

For a more minute and particular view of all the German states, including the Austrian and Prussian dominions, than was consistent with the nature of this work, the reader may be referred to the recent laborious publication by Hoeck, who has carefully indicated the sources whence he derives his intelligence. It must be added that his work is merely what is called in Germany statistic, being a series of tables presenting the extent of each country and district in square miles, the number of towns, villages, and houses, the population, the natural productions, the manufactures, the commerce, the finances, number of universities, and schools, state of the army. The other geographical topics are, by the Germans who invented the term, considered as foreign to the science of statistics.

SUPPLEMENT.

SINCE the first publication of this work, the geography of Germany has undergone many important alterations.

In the part on the north of the Mayn, by the treaty of indemnities 1803, the bishopric of Osnabruck was joined in perpetuity with the electorate of Hanover.

The abbies of Ganersheim and Helmstadt were given to the duke of Brunswick.

The bishoprick of Hildesheim to the king of Prussia.

The landgrave, now elector of Heſſia, received the bailliages of Frizlar, Naumburg, Neuſtadt, and Ameneburg, the town of Gelnhauſſen, &c.

The landgrave of Heſſe-Darmſtadt has received the duchy of Weſtphalia, ſo far as belonged to the elector of Cologne, with ſeveral villages and towns.

There were left only ſix imperial cities in the empire, Hamburg, Frankfort, Bremen, Lubeck, Augſburg, and Nuremburg.

A part of the biſhopric of Mentz, lying in Thuringia, has been given to Pruſſia, with the town of Munſter, containing about twenty-five thouſand inhabitants, and the greater part of that biſhopric and Paderborn.

The biſhoprics of Fulda and Corwey, the imperial town of Dortmund, and ſeveral abbies, have been aſſigned to the prince of Orange, as the indemnity for the office of ſtadtholder, and his domains in Holland.

The greater part of the biſhopric of Wurtzburg has been aſſigned to the elector, now king, of Bavaria.

In the part of Germany, on the ſouth of the Mayn, the elector of Bavaria has received the biſhoprics of Bamburg, Freiſingen, Augſburg, and part of Paſſau, with many abbies and towns; with a general population of about 200,000 ſouls. The palatinate, abandoned by him to France, contained nearly 300,000.

The primacy of Germany is now lodged with the archbiſhop of Ratiſbon.

Heidelberg and Manheim have been given to the margrave, now elector, of Baden, with ſeveral fragments of biſhoprics.

The duke, now king, of Wurtemburg, alſo received important ceſſions, which have been ſtill further increaſed by the treaty of Preſburg 1805.

Of the ſecularized biſhoprics, Salzburg is united to Auſtria; Wurtzburg, as already mentioned, to Bavaria, with Bamburg, Augſburg, &c.

By the treaty of Preſburg, 26th December 1805, the new kingdom of Bavaria acquired the margraviate of Burgau, and its dependencies, the

the principality of Eichſtadt, the part of the territory of Paſſau, belonging to the elector of Salzburg, and ſituated between Bohemia, Auſtria, the Danube, and the Inn; the country of Tyrol, comprehending therein the principalties of Brixen and Botzen, the ſeven lordſhips of the Voralberg, with their detached dependencies; the county of Hohenems, the county of Konigſegg Rottenſels, the lordſhips of Tetnany and Argen, and the town and territory of Lindau.*

The new king of Wurtemburg has acquired the five cities of the Danube, to wit, Ehingen, Munderkengen, Rufflingen, Mengen, and Salgaw, with their dependencies, the city of Conſtance excepted; that part of the Briſgaw which extends into the poſſeſſion of Wurtemburg, and ſituated to the eaſt of a line drawn from Schlegelburg to Molbach, and the towns and territories of Willengen and Brentingen.

The elector of Baden, by the ſame treaty of Preſburg, received the Briſgaw, with the exception of the part above mentioned; the Ortenfau and dependencies; the city of Conſtance, and the commandery of Meinau.

Diſtinct maps of the new kingdoms of Bavaria and Wurtemburg, would give clearer ideas, than any enumeration or deſcription; or new maps of Germany on the north and ſouth of the Mayn, with all the new ſtates accurately coloured.

It is imagined that further alterations are about to take place. Meanwhile the following table will be found uſeful.

Colleges of the Diet.

I. The Electoral College.

The elector arch-chancellor of the empire, prince archbiſhop of Ratiſbon.

The elector king of Bohemia (the emperor).

The elector palatine king of Bavaria.

The elector duke of Saxony.

* But Bavaria is to cede the principality of Wurtzburg to the archduke Ferdinand, with the title of elector. Augſburg, by art. 13, paſſes to the king of Bavaria.

The elector margrave of Brandenburg, (the king of Prussia).

The elector duke of Brunswick-Lunebourg, or Zell, or Hanover, (the king of England).

The elector of Salzburg, or Wurtzburg, (the archduke grand-duke).

The elector margrave of Baden.

The elector king of Wurtemburg.

The elector landgrave of Hesse-Cassel.

II. College of Princes,

WITH THE NUMBER OF VIRIL VOTES.

The king of Prussia as duke of Magdeburg, prince of Hildesheim, margrave of Brandenburg, Anspach, prince of Paderborn, margrave of B. Bayreuth, prince of Halberstadt, and Munster, duke of Further Pomerania, prince of Minden, Camin, East Friesland, Eichsfeld, and Erfurt. - - - - 13

The elector palatine, as duke of Upper and Lower Bavaria, Sulzbach, and Neuburg, prince of Bamburg, duke of Berg, prince of Wurzburg, Augsburg, Freysingen, Passau, and Kempten, landgrave of Leuchtenberg, and prince of Mindelheim. - - 13

The king of England, as duke of Bremen, and Brunswick-Luneburg, or Zell, prince of B. Calemberg, B. Grubenhagen, Osnabruck, and Verden, duke of Saxe-Lauenburg, and prince of Gottingen - 8

The emperor, as archduke of Austria, duke of Stiria, and Carinthia, prince of Trent, and Brixen, duke of Carniola, and count-prince of Tyrol. - - - 7

The elector of Baden, as prince of Bruchsal, Ettenheim, and Constance, margrave of B. Baden, B. Dourlach, and B. Hochberg. - 6

The elector of Wurtemburg, as duke of W. Teck, and W. Wurtemburg, prince of Elwangen, Tubingen, and Zwiefalten. - 5

The elector of Hesse-Cassel, as prince of Hanau, landgrave of Hesse-Cassel, prince of Hirtchfeld, and Fritzlar. - - 4

The

The prince of Naſſau-Dillenburg, as prince of Fulde, Corvey, N. Hadamar, and Naſſau-Dillenburg - - 4

The elector of Saxony, as margrave and burgrave of Miſnia, and prince of Querfurth - - - 3

The elector of Salzburg, as prince of Salzburg, Aichſtaedt, and Berchtolſgaden - - - 3

The duke of Mecklenburg-Schwerin, and M. Guſtrau and prince of Schwerin - - - 3

The landgrave of Heſſe-Darmſtadt, duke of Weſtphalia, and prince of Starkenburg - - - 3

The duke of Saxe-Gotha, and prince of S. Altenburg - 2

The duke of S. Weimar. and prince of S. Eiſenach - 2

The elector arch-chancellor, as prince archbiſhop of Ratiſbon, and prince of Aſchaffenburg - - - 2

The duke of Brunſwick-Wolfenbuttel, and prince of Blankenburg 2

The duke of Holſtein-Oldenburg, and prince of Lubeck - 2

The king of Denmark, as duke of Holſtein-Gluckſtadt, and H. Ploen 2

The prince of Briſgaw, and Ortenau - - 2

The duke of Mecklenburg-Strelitz, as prince of Ratzeburg, and Stargard - - - 2

The prince of Furſtemberg, landgrave of Baar and Stichlingen 2

The prince of Schwarzemberg, and landgrave of S. Kelettgau 2

The prince of Tour and Taxis, and of Buchau - 2

The princes or ſtates following have only one vote: ſome even alternately.

The prince grand maſter and the Teutonic order;—the dukes of Saxe-Coburg Saalfeld, S. Meinungen, and S. Hildburghauſen, for the duchy of Coburg;—the elector of Saxony, the dukes of S. Gotha, and S. Weimar, for the landgraviate of Thuringia;—the prince grand prior, and the grand priory of the order of Malta;—the king of Sweden as duke of Hither Pomerania;—the princes of Anhalt, Deſſau, A. Bernburg and A. Kothen, for the principality of Anhalt;—the electors of Saxony, and Heſſe Caſſel, the dukes of Gotha, Weimar, Coburg Saalfeld, Meinungen, and Hildburghauſen, for the principality of S. Henneberg;—the duke of Aremberg;—the princes of Hohezollern-Hechingen;—Lobkowitz;—Salm-Salm;—Dietrichſtein;—Auerſberg;—Lichtenſtein;—

 Schwarzburg;

Schwarzburg;—Naſſau-Uſingen;—N. Weilburg;—Hohezollern-Sigmaringen;—Salm-Kirburg;—Waldeck;—Læweinſtein-Wertheim;—Oettingen Spielberg;—O. Wallerſtein;—Solms-Braunfels;—Neueſtein;—H. Waldenburg-Schillingsfurst;—H. W. Bartenſtein;—Hoenlohe;—Iſenburg-Birſtein;—Kaunitz-Rittberg;—Reuſs-Plauen-Graiz;—Linange; and Ligne-Edelſtetten;—the duke of Looz-Wolbeck;—the counts of Suabia;—Weteraw;—Franconia;—and Weſtphalia.

III. College of imperial and free Cities.

Hamburg;—Augſburg;—Lubeck;—Nuremburg;—Frankfort;—and Bremen.

The cities of Ratiſbon and Wetzlar are no longer conſidered as imperial, but enjoy an abſolute neutrality, even during the wars of the empire, the firſt as the ſeat of the diet, and the ſecond as that of the imperial chamber.

While this work was at the preſs, the conſtitution of the German empire, that chaos maintained by Providence, according to the expreſſion of a German author, has been annihilated. The kings of Bavaria and Wurtemburg, the electors or grand dukes of Baden and Heſſia, and other princes near the Rhine, having formed a grand confederation, acknowledged by Pruſſia, the emperor Francis II, by his declaration of Auguſt 2, 1806, formally reſigned the title and power of emperor of Germany, only retaining that of Auſtria. This great change had already been foreſeen, and indicated in the firſt edition of this work: but it was vainly ſuppoſed, that the weak Auſtrian government would have had the prudence to prevent the aſcendancy of France.

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ITALIAN


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SAVOY
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DUCHY OF MILAN
PARMA
MODENA
TUSCANY
CHURCH
KINGDOM OF NAPLES
ITALY

ITALIAN STATES.

CHAPTER I.

General Description of Italy.

Divisions.—Boundaries.—Extent.—Original Population.—Present Population.—Face of the Country.—Rivers.—Lakes.—Mountains.—Botany.—Zoology.

THE classical and interesting country of Italy has been so repeatedly described, that it has become familiar even to the common reader. As it is superfluous to write without adding to knowledge, this description shall, in consequence, be restricted to very narrow limits: and will also of necessity be somewhat abridged by the present unsettled state of the country, which, on many topics, scarcely leaves materials even for conjecture. Hence the political and civil departments of geographical description are almost obliterated; and this brief account shall chiefly delineate those lasting features of nature which no political change can influence.

Italy may be regarded as having been, in all ages of history, divided into three parts, the southern, the central, and the northern. The southern part having received many Greek colonies was honoured with the ancient appellation of Magna Græcia: the centre was the seat of Roman

Divisions.

Divisions. Roman and Etrurian power; while the northern was the Cisalpine Gaul. In the middle ages the kingdom of Lombardy, afterwards subdivided, and that of Naples occupied the two extremities, while the church and Tuscan states held the centre. In more modern times, the most distinct division has been the kingdom of Naples in the south: but the centre, and the north, have passed into various sub-divisions and denominations. For which reasons, and the present uncertain state of the country, the northern and middle parts shall be considered rather geographically than politically; the chief mouth of the Po being assumed for the limit on the E. thence following that river till it is joined by the Panaro, (the ancient Scultenna,) up to its source near Castiglione; and thence in a westerly line to the gulph of Spetia, thus tracing nearly the boundary between the former states of the Church and those of Modena, while the gulph of Spetia, (Portus Lunensis,) almost the eastern reach of the Genoese territory, presents a natural and remarkable boundary in the west. These divisions shall be briefly considered in the succeeding chapters, while this is dedicated to the general description of Italy.

The boundaries of this renowned country are deeply impressed by the hand of nature, in the Adriatic and Mediterranean seas, and the grand barrier of the Alps, which divide it from France, Swisserland, and Germany. The length of Italy from mount Rosa, the highest summit of the Italian Alps, to the Cape de Leuca, is about 670 British miles; while the medial breadth between the Adriatic and Mediterranean is about 100; but from the Adige, the recent limit of Austrian power, to the eastern frontiers of the new French departments of Liman, and Mont Blanc (formerly Savoy), the breadth is about 200 miles.

Extent.

Original Population. The original population of the south may be regarded as composed in a great part of Greeks, whence the name of Magna Græcia: the northern part of Illyrians, who were succeeded by German Gauls; and the Etruscans of the centre are said to have been of Lydian extract. The Romans seems to derive their origin from the early Greek colonies; and their language was regarded as an Æolic dialect of the Greek: but as they proceeded from the most barbarous part of Greece at an early epoch, it was a considerable time before their manners, rendered ferocious by

by inceſſant wars, aſſumed a tint of Grecian civilization. The ſucceſſive population, progreſſive geography, hiſtorical epochs, and antiquities of Italy are familiar to every reader, but will occaſionally be briefly commemorated in the ſucceeding chapters. It is almoſt ſuperfluous to add that the religion is the Roman Catholic. The preſent population of Italy, with the iſlands of Sicily, and Sardinia, cannot be eſtimated at more than 13,000,000.[1] The kingdom of Naples and Sicily contains about 6,000,000: the central part about 3,000,000; and the northern about four. The manners, cuſtoms, and dialects are various and diſcordant, though the general language be the Italian, eſteemed the pureſt in Tuſcany, while the enunciation is moſt perfect at Rome.

ORIGINAL POPULATION.

Population.

Italy preſents ſuch a variety of ſcenery, decorated with ſuch noble architecture, and venerable remains of ancient art, amidſt a climate generally ſerene, though liable to violent rains, and ſuch delicious tints of aerial perſpective, that the painter of landſcape is enraptured, and can render but feeble juſtice to the picturesque features and glowing hues of nature. In the north the ſublime ſcenery of the Alps is contraſted with the fertile plains, through which many claſſical ſtreams flow into the Po. In the centre there are many marſhes and ſtanding waters, which occaſion what is called the *mal aria*, or a pernicious diſtemperature of the air; but the varied ridge of the Apennines and the beautiful proſpects of Florence and Tivoli excite univerſal admiration. A great part of the kingdom of Naples is mountainous; but the country generally beautiful; yet in addition to the fiery eruptions of Veſuvius and Etna, it is expoſed to the terrible effects of frequent earthquakes; and the enervating ſirocco.*

Face of the Country.

Italy is interſected with rivers in almoſt every direction, of which the Po is by far the moſt large and extenſive. This noble river, celebrated from the early ages of Grecian mythology, and called by the ancients Padus and Eridanus, riſes from mount Veſula, or Viſo, on the very confines of France and Italy, nearly in the parallel of mount Dauphin, in Dauphiné, and Saluzzo, in Piedmont, being almoſt cen-

Rivers.

Po.

[1] Boetticher.

* Any pernicious wind is in Italy called *ſirocco*, in the ſouth applied to the hot blaſts from Africa, in the north to the bleak winds from the Alps.

Rivers. tral between them, at the diſtance of about eighteen Engliſh miles from each. Thus deſcending from the centre of the weſtern Alps, the Po paſſes to the N. E. of Saluzzo, by Carignan, to Turin; receiving even in thi- ſhort ſpace many rivers, as the Varrita, Maira, and Grana from the ſouth; and from the N. the Felice, Sagon, and others. Moſt of theſe ſtreams having had a longer courſe than what is called that of the Po, the Maira, for inſtance, might perhaps be more juſtly regarded as the principal river: nay the Tanaro, which flows into the Po ſome miles below Alexandria, might perhaps claim, in the river Stura, a more remote ſource than the Po itſelf. After leaving the walls of Turin, the Po receives innumerable rivers and rivulets from the Alps in the N. and the Apennines in the S. Among the former may be named the Doria, the Teſino, the Adda, the Oglio, the Mincio: to the eaſt of which the Adige, an independent ſtream, deſcends from the Alps of Tyrol, and refuſing to blend his waters with the Po purſues his courſe to the gulph of Venice. From the ſouth the Po firſt receives the copious Alpine river Tanaro, itſelf ſwelled by the Belba, Bormida, and other ſtreams: the other ſouthern rivers are of far leſs conſequence, but among them may be named the Trebbia, the river of Parma, and the Panaro, which joins the Po at Stellato, on the weſtern frontier of the former territory of Ferrara. The courſe of the Po may be comparatively eſtimated at about 300 Britiſh miles; ſo that when Buſching pronounces it the ſecond river in Europe, after the Danube, he muſt have forgotten the Rhine, the Elbe, the Oder, the Viſtula, not to mention the Loire of France, the Tajo of Spain, and other noble ſtreams! The numerous tributary rivers, from the Alps and Apennines, bring down ſo much ſand and gravel that the bed of the Po has in modern times been conſiderably raiſed, ſo that in many places banks of thirty feet in height are neceſſary to preſerve the country from inundation. Hence hydraulics have been much ſtudied in the north of Italy; and the numerous canals of irrigation delight and inſtruct the traveller. Perhaps by deepening the chief eſtuary, and bed of the river, equal ſervice might have been rendered to commerce. In the middle ages maritime combats took place on the Po, between Venice and ſome of the inland powers. It is remarkable that, from Cremona to the ſea,

 there

there is no capital city founded on the main ſtream of the Po; and the caſe was the ſame in ancient times; an exception to the ſuppoſition that every river has ſome grand city near its eſtuary.* Rivers.

The other rivers of the north of Italy, as the Adige, the Brenta, the Piavi, and the Tagliamento, muſt now rather be regarded as Auſtrian ſtreams.

In the centre firſt appears the Arno, which riſes in the Apennines, and flows by Florence and Piſa into the gulph of Genoa. The Tiber, an immortal ſtream, is by far the moſt conſiderable in the middle, or ſouth of Italy, riſing near the ſource of the Arno, S. E. of St. Marino, and paſſing by Perugia, and Rome, to the Mediterranean, which it joins after a courſe of about 150 Britiſh miles. The Tiber is ſaid to receive about forty-two rivers, or torrents, many of them celebrated in Roman hiſtory; as is the Rubicon, a diminutive ſtream, now the Fiumeſino, which enters the Adriatic about eight Britiſh miles to the N. of Rimini. In this central part of Italy many ſmall ſtreams flow from the Apennines both to the Mediterranean and Adriatic; but after the Tiber no river can be mentioned in this, or the ſouthern diviſion, whoſe courſe deſerves the notice of general geography. Arno. Tiber.

Italy contains many beautiful lakes, particularly in the northern diviſion. The Lago Maggiore, Greater Lake, or lake of Locarno, is about twenty-ſeven Britiſh miles in length, by three of medial breadth; and the ſhores abound with Alpine beauties, receiving the waters of ſome other lakes, among which muſt be mentioned that of Lugano on the eaſt. This lake formerly adjoined to the Milaneſe territory, and contains the beautiful Boromean iſles, celebrated by many travellers.† Still further to the eaſt is the lake of Como, which is joined by that of Lecco: the lake of Como is about thirty-two Britiſh miles in length, but the medial breadth not above two and a half. Yet further to the eaſt is the ſmall lake of Iſeo, which is followed by the noble Lago di Lakes. Locarno.

* To the N. of Ferrara the Po ſeems as broad as the Rhine at Duſſeldorf, Stolberg, ii. 576: but is probably not above half as deep. Dr. Smith, ii. 360, compares the Po, near Ferrara, to the Maeſe at Rotterdam, and ſays it is nearly as wide. That *Maeſe* is only a *branch* of the Rhine.

† At Arona, where the Teſino joins the lake, is or was the bronze coloſſus of St. Charles Boromeo, eſteemed the largeſt in Europe. Denina, *Tableau*, p. 139.

Garda,

Lakes. Garda, an expanſe of about thirty Britiſh miles in length by eight in breadth.

In the central part of Italy the largeſt lakes are thoſe of Perugia and Bolſena, with thoſe to the north of Rieti. Some ſmall lakes are alſo celebrated, as that of Albano, ſhaded by trees and rocks, and that of Nemi in the ſame vicinity, about ſeventeen miles S. E. from Rome. In the Neapolitan part is the lake of Celano in the north; and that of Varano, near mount Gargano: nor is there any large lake in the ſouthern part, or in the iſland of Sicily, in which laſt that of Beverio, near Lentini, is the moſt remarkable.

Mountains. The moſt important mountains of Italy are the Alps, already in a great meaſure deſcribed, under the article of Swiſſerland. The maritime Alps rise from the ſea to the weſt of Oneglia, and are ſucceeded by other denominations, extending due north to mont Blanc, the ancient boundary of Savoy, and now a French mountain.* The moſt remarkable paſſage through the maritime Alps is the Col de Tende. Few ſummits in this weſtern chain have received particular denominations: the chief are mount Viſo, which gives ſource to the Po; and mount Cenis a noted paſſage to Turin. Other names are mount Genevre, mount Iſeran, Roch Michel,† &c. In general the weſtern Alps rise, in ſucceſſive elevation, from the ſea to mount Blanc. Sauſſure has explained, with his uſual ability, the compoſition of this chain of the Alps.[2] The calcareous mountains near Geneva, are followed by granitic mixtures of mica and quartz, with argillaceous ſchiſtus, and ſerpentine. From mount Blanc the grand chain of the Italian Alps bends N. E., preſenting the high ſummits of the great St. Bernard, and mount Maudit, Combin, Cervin, and mount Roſa, the laſt nearly approaching mount Blanc itſelf in height. In his laſt volume Sauſſure

Alps.

* The country of Nice has alſo been ſeized by the French, and ſtyled the department of the maritime Alps; the higheſt chain of theſe Alps, through which is the Col de Tende, forming the exterior boundary of the country of Nice.

† Keyſler, i. 202. idly aſſerts that the Roche Melon, near mont Cenis, is ſuppoſed to be the higheſt of the Italian Alps. It is 11,977 Engliſh feet above the ſea; while Little mont Cenis is 9956. Smith, iii. 138. Mount Roſa exceeds 15,500. Mont Blanc by Sir G. Shuckborough 15,662; by De Luc 15,304. Denina, 179. aſſerts that Hannibal muſt have paſſed by M. Viſo, or M. Genevre. In the text of Polybius, for *Arar*, read Iſara. Ib. 380.

[2] Voyage, tome v.

 has

has given ample detals concerning this vaſt mountain, which has remained unnoted in the maps, while a fictitious mount Moro has ſupplied its place. Mount Roſa forms as it were a circus of gigantic peaks, ſurrounding the village of Macugnaga, a ſingularity of form ſtrongly contraſting with mount Blanc, and ſuppoſed to impart the name from ſome reſemblance to an expanded roſe.[3] While mount Blanc, and the adjacent high ſummits, are compoſed of vertical ſtrata, the moſt elevated peaks of mount Roſa are horizontal, or not inclined more than 30°. The ſtructure is equally different; for while mount Blanc conſiſts of vaſt maſſes of granite, mount Roſa is chiefly of gneiſs, or ſchiſtoſe granite, and other ſlaty rocks. So various are the great operations of nature, where theory would expect ſimilarity. MOUNTAINS.

From mount Roſa this grand chain continues it progreſs N. E. by Simplon, &c. through the country of the Griſons to the glaciers of Tyrol, terminating in the Salzian Alps. This chief chain paſſing through the centre of Tyrol, ought indeed to form the boundary between Germany and Italy; for the Italian Alps, to the north of the former Milaneſe and Venetian territories, are of comparatively ſmall elevation. Mount Baldo on the eaſt of the lake di Garda, deſerves to be mentioned, only on account of its botanical wealth, and literary celebrity; the higheſt by far of the Italian Alps belonging to the country of Piedmont.*

The next grand chain of Italian mountains is that of the Apennines. While the weſtern Alps branch off on one ſide into the mountains of Dauphiné,† on the other the Apennines are at firſt a branch of the Alps, which ſeparates the plains of Piedmont from the ſea.[4] Thus the Apennines.

[3] Sauſſure, viii. 54.

* Mr. Strange publiſhed at Milan, in 1778, an account of ſeveral columnar hills in the north of Italy. He ſuppoſes the columnar ſubſtance to be ſometimes granitic, but it is ſuſpected that he confounded grunſtein, which is an impure baſalt, with granite. But the granite which he found in the Euganian hills in an orbicular form, plate iv fig. 6. reſembles that of Corſica. Mr. Strange obſerved in Wales in the church-yard of Towen, county of Merioneth, not far from Dolgelthy, baſaltic columns uſed for tombs, but knew not from whence they came, perhaps from Cader Idris.

† Some would extend this chain to the Pyrenees; but a great and accurate obſerver remarks that it is entirely interrupted by the wide plains of lower Provence, and Languedoc. Sauſſure, v. 222.

[4] Sauſſure, v. 221.

Apennines

MOUNTAINS.

Apennines begin near Ormea, in that high ridge which now forms the boundary of the French department of the maritime Alps, and ftretch without any interruption along both fides of the gulph of Genoa, at no great diftance from the fea, giving fource to many rivers flowing to the north and to the eaft. In the fouth of the former territory of Modena, after giving rife to the Panaro, and Reno, they proceed almoft due eaft to the centre of Italy, where they afford fources to the Arno, and the Tiber, and thence pafs S. E. to the extremities of Italy, generally approaching nearer to the Adriatic than to the Mediterranean. The noted mount Gargano is, as it were, a fpur of the Apennines to the north of the gulph of Manfredonia. In general the Apennines may rather be regarded as hills than as mountains. The higheft fummit is Monte Velino, near the middle of Italy, 7872 feet above the fea: Cimone in the N. is about 6,000. Ferber[5] found them to confift, to the S. of Bologna, of ftratified grey hard limeftone, with a few petrifactions. Yet in the Genoefe territory, and Tufcany appear not only the beautiful marble of Carrara, but rich ferpentine, here called Gabbro, with fteatite and afbeftos. What is called granitone is alfo found, confifting of white felfpar and green mica.[6] The territory of Sienna prefents fome granitic hills, with flate, ferpentine, and the noted yellow marble with black veins, found at Montarenti, and many metallic ores; this diftrict being after Piedmont, perhaps the richeft mineral region in Italy; but the hills feem rather diftinct than connected with the Apennine ridge, from which they are divided by the Chiano, and the Tiber, the moft noted of the Siennefe hills being Monte Pulciano.*

Volcanoes.

Having thus briefly confidered the chief ridges of Italian mountains, thofe fublime features of the country the volcanoes muft not be omitted. They only occur in the fouthern divifion, and have recently received fcientific illuftration from the able and accurate pen of Spallanzani.

Vefuvius.

Vefuvius is a conic detached mountain, above 3,600 feet high, but

[5] Italy, 76.

[6] Italy, 250. From Dolomieu's account of the earthquakes in Calabria, Rome, 1784, 8vo. it appears that this part of the Apennines ends in white granite, gneifs, micaceous fchiftus, and fometimes hornblend.

* There are beautiful variegated alabaffers at Volterra, Buffon, Min. i. 274. but fome fuppofe that the fineft ancient alabaffers came from Spain, which abounds in that fubftance.

feems

ſeems chiefly calcareous, like the Apennines, as it frequently ejects marble, calcareous ſpar, gypſum, and ſimilar ſubſtances.[7] The lava, as uſual, is generally with a baſis of hornblend; a ſubſtance which conſiſts in a great degree of iron, is liable to eaſy fuſion with ſulphur: and it is ſometimes mingled with felſpar, quartz, or granite, ſeemingly ejected from great depths. The terrors of an eruption, the ſubterranean thunders, the thickening ſmoke, the ruddy flames, the ſtony ſhowers ejected to a prodigious height, amidſt the corruſcations of native lightning, the throes of the mountain, the eruption of the lava, deſcending in a horrid and copious ſtream of deſtruction, have exerciſed the powers of many writers, but far exceed the utmoſt energy of deſcription. Volcanoes.

Yet Veſuvius, placed by the ſide of Etna, would ſeem a ſmall ejected hill, the whole circuit of its baſe not exceeding 30 miles, while Etna covers a ſpace of 180, and its height above the ſea is computed at about 11,000 feet.[8] This enormous maſs is ſurrounded by ſmaller mountains, ſome of which equal Veſuvius in ſize; and while the lava of the latter may devolve its ſtream for ſeven miles, Etna will emit a liquid fire thirty miles in length. The crater of Veſuvius never exceeds half a mile in circumference, while that of Etna is commonly three, and ſometimes ſix miles. Spallanzani has minutely deſcribed the crater of Etna, which many travellers have pretended to viſit. It was an oval, extending from E. to W. incloſed by vaſt fragments of lava and ſcoriæ; the inner ſides being of various declinations, incruſted with orange coloured concretions of muriat of ammoniac. The bottom was a plain nearly horizontal, about two thirds of a mile in circumference, with a large circular aperture, giving vent to a column of white ſmoke, at the bottom of which was viſible a liquid fiery matter, like metal, boiling in a furnace. Such is the height of Etna that the eruptions rarely attain the ſummit, but more uſually break out at the ſides. Near the crater begins the region of perpetual ſnow and ice; which is followed by the woody regions;* vaſt foreſts of oak, beeches, firs, and Etna.

[7] Ferber, 139. [8] Spallanzani, i. 195.

* The ruined turret called the Tower of the Philoſopher is well conjectured by M. de Non, p. 67, to have been erected on occaſion of the emperor Hadrian's viſit to Etna.

Volcanoes. and pines, while the upper is almoſt deſtitute of vegetation. In this middle region alſo appear cheſnut trees of enormous ſize; one in particular diſtinguiſhed by the name *di Cento Cavalli*, the circumference of which has been found to be 204 feet, an amazing phænomenon of vegetation. Dolomieu has publiſhed a minute catalogue of all the mineral products of Etna; the lavas being moſtly with a baſis of hornblend, while many others are compact felſpar, the petroſilex of ſome authors: the ejected ſtones are granitic or calcareous. Dolomieu aſſerts that Etna may be ſaid to be ſurrounded with columns of baſalt, which he calls priſmatic lava; but Spallanzani[9] obſerves that he has carefully examined the ſhore, which is volcanic for nearly 23 miles, "one third of it beginning at Catania, and proceeding to Caſtello di Jaci, conſiſts of priſms more or leſs characterized, and ſuch as they have been deſcribed by M. Dolomieu; but the two other thirds, though equally compoſed of lavas with the former, and for the moſt part falling perpendicularly into the ſea, have no ſuch figure; and only preſent here and there irregular fiſſures, and angular pieces, ſuch as are generally obſervable in all lavas, which ſeparate more or leſs on their congelation."*

Stromboli. The iſlands of Lipari, to the north of Sicily, alſo contain many volcanoes, of which Stromboli is the chief. This crater is diſtinguiſhed from any other by conſtant momentary eruptions of ſhowers of ſtones, which, from its poſition in the ſide of the hill, are confined, and relapſe into the volcano, thus ſupplying endleſs materials.[10] The iſle called Vulcano preſents a moſt capacious crater; but the materials of eruption ſeem exhauſted. The lava has a baſe of compact felſpar; and Spal-

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Mr. Kirwan, Geog. Eſſ. 268, ſays that the lavas of Etna are moſtly porphyreous, whence he argues that the baſis is porphyry. But theſe lavas (Dolomieu, 212) are of hornblend, with cryſtals of felſpar, ſo that it would be more juſt to infer that the baſis is iron ore.

[9] iii. 204.

* Spallanzani is of opinion that baſalt is ſometimes formed by fire, and ſometimes by water. Other ſubſtances alſo aſſume the priſmatic form, as the columns of red jaſper near Dunbar, in Scotland. Some ores of iron alſo affect it; and the other ſubſtances are ſtrongly impregnated with that metal, which ſeems the real and radical cauſe of that cryſtalliſation.

[10] Spallanzani, ii. 52.

lanzani

lanzani here found ſmall priſms of baſalt, about a foot in length." The iſle of Lipari, containing the town ſo called, preſents vaſt rocks of volcanic glaſs; and the hill called Campo Bianco, three miles from the town of Lipari, contains almoſt all the pumices which are employed for various purpoſes in Europe.* Felicuda, and Alicuda, the two extreme Liparian iſlands towards the weſt, alſo diſplay proofs of their having anciently contained volcanoes; and recent authors have diſcovered ſimilar proofs in the iſle of Iſchia, and in thoſe of † Ponza, to the north of the gulph of Naples; while that of Capri, to the S. ofthat gulph, is ſuppoſed to be chiefly calcareous. Volcanoes.

There are ſtill ſome remains of foreſts in ſome parts of the Apennines; but the early civilization of Italy ſeems to have been diſadvantageous to the growth of timber. The woods of mount Gargano are celebrated by the ancient claſſics, and the foreſts of Etna appear to be extenſive. Foreſts.

It is probable that the botanic treaſures of Italy are at leaſt equal to thoſe of any other European country on account of the great variety of its ſoil, the irregularity of its ſurface, and the genial benignity of its climate: excepting however Piedmont, which has been ably ſurveyed by Allioni, the reſt of this fine country, eſpecially its ſouthern provinces, has by no means received that degree of notice which it merits: the vale of Enna, the foreſts of Apulia, the romantic ſcenes of Calabria, and the warm ſhore of the Tarentine bay contain a rich harveſt for future naturaliſts, and will no doubt grace the flora of Italy with many new ſpecies. Botany.

The alpine barrier of the north of Italy, and the long range of the Apennines preſent a number of plants, inhabitants of the higheſt mountains, which have already been enumerated in the botany of Swiſſerland.

The weſtern coaſt has been perhaps the beſt explored, and has in conſequence been found to be profuſe of beauties: the ſtately *tree-*

" Spallanzani, ii. 260—5, &c.

* The Lipari iſlands have been ably deſcribed by Dolomieu. *Voyage*, Paris 1783, 8vo. He ſuppoſes, p. 67, that pumice was originally gneiſs, micaceous ſchiſtus, or granite.

† See Dolomieu ſur les iſles Ponces, et catalogue raiſonné des produits de l'Etna. Paris 1788, 8vo.

Botany. *heath*, with the two elegant ſhrubby euphorbias, the evergreen *arbutus*, and the *tamariſk*, mantle over the ſummits of the cliffs, or bend midway, from them towards the ſea: the dryer rocks, and of a more ſcanty ſoil, are crowned with the *great aloe*, while their ſides are adorned with the *Indian fig*. The ſtony beach, and the ſandy receſſes of the bays delight the eye with the ſnowy bloſſoms of the *caper buſh*, and the glow of *amethyſtine eryngo*, with the *lavender*, the *roſemary*, the glaucous foliage of the ſtrong ſcented *rue*, the *tree ſouthern-wood*, and the ſplendid *lavatera arborea*.

The ſides of the ſtreams are bordered by the *oleander*, the *myrtle*, the *Cornelian cherry*, and the *Spaniſh reed*, whoſe tall jointed ſtem, and long ſimple leaves almoſt emulate the bamboo of India.

The dry heathy tracts of the interior of the country are covered with nearly the ſame ſpecies as characterize thoſe of Spain.

Among the trees, beſides the common ones of Britain, we find the *olive*, the *date plum*, the *ſtorax tree*, the *bead tree*, the *almond*, the *pomegranate*, the *azarole plum*, the *pyracantha*, the *carob tree*, the ilex, the *piſtachia*, the *manna-tree*, the *cypreſs*, the *date palm*, the *lemon*, the *orange*, the *fig*, and the *vine*.

Of the flowering ſhrubs, and lower trees, the principal are the *lilac*, the *jaſmine*, and *yellow jaſmine*, the *ſyringa*, the *laburnum*, and *Spaniſh broom*; the *provence roſe*, the *lauruſtinus*, the *bay*, and the *laurel*.

The ſublime ruins of ancient art, and the inſulated rocks that often ſerve them for a baſe, afford a favourite ſituation for the *red valerian*, *antirrhinum cymbalaria*, *majus*, and *orontium*, *cucorum tricoccum*, *cotyledon umbilicus-veneris*, and *coronilla glauca*.

In the ſouthern parts *cotton*, *rice*, and the *ſugar cane* indicate the fertility of the ſoil, and the warmth of the climate; and the fields, and paſtures, as far as they have been examined, bear a ſtriking reſemblance in their native products to thoſe which have been already mentioned, as enlivening the ſouthern provinces of Spain *.

Zoology. The Italian horſes are of little reputation. The cows of the Lodizan, where the noted cheeſe is now made, which was formerly produced near

* Allioni Flora Pedemontana—Turra Flor. Ital. prodromus—Dr. Smith's Travels.

Parma,

Parma, are deſcribed by Mr. Young as generally of a blood red colour, long, lank, and ill made.[12] The ſame writer obſerves that though in Tuſcany the number of cattle be far inferior to what might be expected, yet the art of fattening oxen is well underſtood. The buffalo is in Europe almoſt peculiar to Italy; an animal, though tame, of ferocious aſpect, and as different from the bull, as the aſs is from the horſe. In manners he ſomewhat reſembles the hog, being fond of wallowing in mud, his fleſh is coarſe, and his hide, though light, is ſo firm as to have ſupplied the buff coats, or armour of the ſeventeenth century. Originally it is ſuppoſed from Africa, he is little adapted to any cold climate. The marmot, and the ibex are alſo reckoned among the animals of the Apennines; and the creſted porcupine is eſteemed peculiar to the ſouth of Italy. Among birds may be mentioned the little falcon of Malta, the certhia muraria, and the turdus roſeus, and cyanus, with the alauda ſpinoletta, and other ſorts of land and water fowl. The remaining topics ſhall be treated under each diviſion. ZOOLOGY.

[12] France, ii. 191.

CHAPTER II.

The Southern Part of Italy.

Naples and Sicily, with the adjacent Isles.

Naples and Sicily.

THIS division comprises the kingdom of Naples and Sicily; being divided from the central part chiefly by an arbitrary line; nor has nature indeed marked any precise distinction, except some rivers were assumed as boundaries, towards the Mediterranean and Adriatic. Sicily is about 170 British miles in length, by 70 of medial breadth: while this part of Italy exceeds 300 miles in length by 100 in breadth. Square miles 29,824, with six millions of inhabitants.

After the fall of the Roman empire this part of Italy underwent various revolutions. The powerful princes of Benevento survived the conquest of the north of Italy by Charlemagne; and with other potentates in this quarter acknowledged the supremacy of the Greek empire, from which Sicily had been wrested A. D. 828 by the Saracens, who possessed it till A. D. 1058.* A pilgrimage to St. Michael of mount Gargano induced the Normans to attempt the conquest, which was gradually accomplished, both Saracens and Greeks being expelled. The Norman leaders became dukes of Apulia, Calabria, and Sicily: and Roger was named king of Sicily by the pope, A. D. 1130. The Norman line continued till their kingdom was subdued by Henry VI, emperor of Germany. After internal contests Charles of Anjou became king of Sicily 1266: after the Sicilian vespers, 1282, Sicily was seized by a

Historical Epochs.

* Sardinia was subdued about the same time, and was regained by the Pisans and Genoese in the year 1016.

To enumerate the antiquities of the Sicilian kingdom would be infinite, as besides those of Herculaneum, there are innumerable remains of Grecian architecture in the S. of Italy, and in Sicily, particularly the grand temple near Girgenti.

fleet ſent by the kings of Arragon, but Naples continued to acknowledge the line of Anjou, which expired in the infamous Jean 1382. René of Anjou, king of Naples 1435, was the father of Margaret wife of Henry VI of England: but the French line failed in 1481, in Charles count de Maine, who named Louis XI king of France his heir, whence the pretenſion of France to the kingdom of Naples. The Spaniſh line of Naples and Sicily continued till 1714, when they paſſed to the houſe of Auſtria; but were transferred to that of Bourbon 1736, in the perſon of Don Carlos duke of Parma and Placentia, ſon of Philip V king of Spain, and of Elizabeth of Parma: who ſucceeding to the crown of Spain 1759, he conferred his Italian kingdom on Don Ferdinand his third ſon, who married the ſiſter of the emperor of Germany in 1768.* NAPLES AND SICILY.

The numerous antiquities are known to every reader, particularly thoſe of Herculaneum and Pompeia.†

Though the religion be the Roman Catholic, the inquiſition has been carefully excluded. Few men of diſtinguiſhed genius have recently appeared in this portion of Italy, which is over-run with prieſts and lawyers: but among the latter Giannone has diſtinguiſhed himſelf by his ſpirited hiſtory of his country. There are no leſs than 20 archbiſhoprics, and 125 epiſcopal ſees; but no univerſity of any reputation. The eccleſiaſtics are computed at 200,000; and it is ſuppoſed that about one half of the lands is in their poſſeſſion. Religion.

The government is nearly deſpotic. The laws are contained in the Codex Carolinus publiſhed in 1754. The political importance is inconſiderable: but the French have never without great loſs penetrated far into Italy, and it is probable that experience will teach them to abſtain in future.

The chief city is Naples, eſteemed, after Conſtantinople, the moſt beautiful capital in the world: the inhabitants are computed at 380,000.‡

* The kingdom of Naples has been aſſigned to prince Joſeph, the brother of the French emperor. Not one ſtruggle occurred, the people having been ſo much oppreſſed by taxation that, as uſual in ſuch caſes, a change of maſters had become an object of indifference, if not of hope.

† At Pompeia a Roman houſe almoſt complete, was diſcovered in 1805.

‡ Amalfi, about 30 miles S. E. of Naples, was formerly a celebrated city and ſea-port, remarkable for the ſuppoſed invention of the mariner's compaſs, and for the diſcovery of the pandects of Juſtinian, A. D. 1137.

Palermo

NAPLES AND SICILY.

Palermo in Sicily is ſuppoſed to contain 130,000. Meſſina was nearly deſtroyed by an earthquake, 1783; but Bari is ſaid to contain 30,000 ſouls, and Catanea 26,000.

Beſides excellent wines, oranges, olives, rice, and flax, this kingdom abounds in cattle; and ſome parts are celebrated for the produce of manna and ſaffron.* Calabria is very fertile in *agrumi*, that is oranges, lemons, limes; but is expoſed to violent earthquakes. That of 1783 has been deſcribed by Dolomieu: that of 1805 deſtroyed Iſernia, and many other towns. The manufactures, particularly thoſe of ſilk and woollen, date from the reign of Ferdinand I of Arragon; and theſe, with the native products, conſtitute the chief articles of trade.

Sicily is thought to be the native country of the ſugar cane, indigenous however in the Eaſt and Weſt Indies. The papyrus is alſo found in Sicily, perhaps transferred from Egypt. The mines of Naples are few and inconſiderable, or have at leaſt been little explored: the chief are near Fiume di Niſi in Sicily, where there are mines of antimony; and ſpecimens are found of gold, lead, ſilver, and copper.[1] Iron manufactures have been recently inſtituted near Naples, but the mines and the agriculture are alike neglected; and Sicily, anciently ſo fertile in grain, is now of little account.

The revenue is computed at 1,400,000l. ſterling, and the army at 40,000. There are about four ſhips of the line, and four frigates.

Mountains.

The mountains have been already mentioned in the general deſcription of Italy, conſiſting chiefly of the Apennines which branch out through Apulia to Otranto, and through Calabria to Cape Spartivento.†

Rivers.

The rivers are inconſiderable, being chiefly the Garigliano, which under the name of Liri may be traced from near the lake of Celano to

* The tillage is ſaid to be excellent, Stolberg, i. 459; yet the ſame author obſerves that the ſouthern provinces are wholly neglected.

[1] De Non, 402.

† But theſe branches are very low, according to Stolberg. The ſame author, ii. 131, gives a curious repreſentation of the ſtone hovels near Trani on the northern ſhore of Apulia, which greatly reſemble what are called the Picts' houſes in Scotland.

Mont Scuderi to the north of Etna, is the higheſt in Sicily after that mountain, and retains ſnow all the year. The mines of Sicily, which are very rich, are in an argillaceous ſchiſtus; which, with gneiſs and micaceous ſchiſtus, commonly preſents the greateſt abundance of minerals.

the gulph of Gaeta; and with the river that flows to Pescara, and that lake, might afford a natural boundary to the north, were a new division of Italy to happen. The Volturno passes by Capua, while the Sangro from an adjoining source runs to the Adriatic. The others are rather rivulets; nor can those of Sicily aspire to a higher appellation, the chief of the latter being the Himera, or Salso, running to the south. NAPLES AND SICILY.

The natural curiosities of these regions are numerous and interesting, independent of the grand volcanic appearances. About six miles from Girgenti, and very remote from Etna, there is a singular volcano, which in 1777 darted forth a high column of potters' earth, of which there are continual ebullitions from about sixty small apertures.[2] The papyrus is only found in the Nile, and in the fountain of Cyane, which flows into the river Anapus near Syracuse. Spallanzani has explained the noted wonders of Scylla and Charybdis; the former being a lofty rock on the Calabrian shore, with some caverns at the bottom, which by the agitation of the waves emits sounds resembling the barking of dogs. The only danger is when the current and winds are in opposition, so that vessels are impelled towards the rock. Charybdis is not a whirlpool, or involving vortex, but a spot where the waves are greatly agitated by pointed rocks, and the depth does not exceed 500 feet. Scylla. Charybdis.

The isles of Lipari contain many natural curiosities, as the rocks of volcanic glass, and the spacious cavern in Felicuda called the Grotto of the Sea Ox, which from an aperture of 40 feet high opens into a hall near 200 feet long, 120 broad, and 65 high.[3] This cavern is in lava, and only accessible by sea; and our author supposes that it was occasioned by the action of the gases in the lava, when fluid; as there are examples in Etna of caverns, far more deep, produced by a similar cause. The stoves or warm caves of Lipari have suffered by neglect. The small isles off the gulph of Gaeta also present singular features. While Capri, the Caprea of antiquity and scene of the debaucheries of Tiberius, is calcareous, and seems merely an elongation of the adjoining promontory; Isles.

[2] De Non, 740. [3] Spallanzani, iii. 99.

NAPLES AND SICILY.

promontory; the isle of Ischia, to the north, abounds with volcanic substances.[4]

Dolomieu has ably described the isles of Ponza, which he observes are inaccurately laid down in the maps, which present isles that do not exist and omit others. About 30 miles to the north of Ischia, and 50 from the Italian shore, is Pendataria, famous for the exile of Julia the daughter of Augustus, now called Ventotiene, with the small isle of San Stephano to the east. The three other Ponzian isles are about 20 miles to the N. W. of these two. Ponza, the largest, is in the middle; a narrow isle, extending from N. E. to S. W. in length about four miles. Palmarola is about four miles to the W. of Ponza, length from N. to S. about three miles, and very narrow. Zanone is about four miles to the N. E. of Ponza, in breadth and length about one mile. In the Adriatic sea, not far from mount Gargano, are the small isles of Tremiti, the Diomedeæ of antiquity. Sicily being an important part of the kingdom has been already considered. To the N. of this great isle, and at a considerable distance from those of Lipari, is the small isle of Ustica, and at a still greater distance from the south Pantalaria.

Pendataria.

Ponza.

The isles of Malta and Gozo are of far more consequence, but have been so frequently described that the theme is trivial. These isles are rocky and barren, not producing grain sufficient for half the consumpt of a thin population; but might in the hands of the English prove a valuable acquisition. Malta is about 50 British miles in circumference, and is supposed to contain 60,000 inhabitants. The isle of Gozo is about half the extent, and is rather fertile, the population being computed at 3000.

[4] Ferber Italy, 178. See a description of this isle by Addison in his remarks on Italy. On the opposite shores is found that remarkable stone which when watered produces mushrooms.

CHAPTER. III.

THE CENTRAL PART OF ITALY.

Dominions of the Church.—Tuſcany.—Lucca.—St. Marino.—Piombino, and the Iſle of Elba.

THIS portion comprehends the Dominions of the Church, and the grand duchy, now kingdom, of Tuſcany; with a few diminutive ſtates, as the republics of Lucca and St. Marino, the principality of Piombino, and the ſmall portion of territory around Orbitello belonging to the kingdom of Naples.

DOMINIONS OF THE CHURCH. Extent. Progreſſive Geography.

The territory belonging to the Pope is the chief in extent, reaching from the Po to beyond Terracina, a length of more than 260 Britiſh miles: but, on 13,808 ſquare miles, contains little more than two millions of inhabitants. The ſecular power of the Popes dates from the age of Charlemagne, and the forged collection of papal reſcripts, publiſhed in the ninth century under the name of Iſidorus, led to ſucceſſive accumulations of dominion. The ſmall territory granted in the eighth century, was encreaſed by the acquiſition of Benevento in the eleventh; after which there was a pauſe: and the Popes themſelves were conſtrained to reſide at Avignon. Hence Dante and Petrarca ſatirized Rome, not becauſe it was papal, as our reformers conceived, but becauſe it was in oppoſition to the Popes. In 1513 Bologna was acquired by Julius II: the marquiſate of Ancona followed in 1532: Ferrara 1598: Urbino 1626. The Pontiff is elected by the cardinals, a kind of chapter conſiſting nominally of prieſts and deacons, but in effect of opulent eccleſiaſtics, who are elevated to this dignity by their ſervices to the church, by family connexions, or by princely recommendation. The nature of the papal power is a bar to induſtry; and the Popes rarely

Dominions of the Church.

attempt to restore the country to its former fertility, though Pius VI made ineffectual efforts to drain the Pontine marshes.* Almost the only exports from the Papal states are a superior kind of alum, prepared from a whitish argillaceous rock at Tolfa near Civita Vecchia; from which place also puzzolana is exported, being yellowish brown ashes, containing particles of iron, whence it forms a strong cement, which might be imitated by mixing filings of iron with mortar.†

Rome.

Rome is supposed to contain 162,800 inhabitants: Bologna (famous for an ancient university) 80,000: and Ancona 20,000. The revenue arising from the papal territory was computed at about 350,000l. sterling; but by exactions in foreign countries was raised to about 800,000l. Yet there was a large debt, bearing eight per cent. interest, a sure proof of the want of industry and prosperity. The papal power seems now to be supported only by the influence of Austria.

Rivers.

The chief river, as already mentioned, is the Tiber, which running from N. to S. pervades so great a part of the centre of Italy, that this portion might be named Italia Teverina; the southern Italia Volcanica; and the northern Italia Paduana, from the river Po. The rivers flowing into the Tiber are the Chiano from the west; and the Nera from the east, which receives the Velino from the south: not far to the north of Rome the Teverone joins the Tiber, more noted for beautiful cascades near Tivoli than for the length of its course. The Velino displays a noble cascade of about 300 feet near Terni.‡

Tuscany.

The grand duchy, now kingdom, of Tuscany, has long been celebrated for the arts; and Florence is regarded as the Athens of modern Italy. This principality is about 120 British miles in length by 90 in breadth; but on 7,040 square miles contains a population of about

Extent.

* Count Stolberg allows that the eastern provinces of Urbino, Romagna, and the march of Ancona, are in a high state of cultivation and prosperity. Travels, i. 459. See also Dr. Smith's praise of the country round Loretto, ii. 310.

† Near Ancona are found large stones containing what are called sea-dates, a delicate species of shell fish. Keysler, iv. 41. They are also found in the south of France.

‡ Between Bologna and Giogo is the perpetual flame of Pietra Mala, blue in some parts, red in others, and so strong as to enlighten the adjacent hills. La Lande Voyage en Italie, Paris 1786, ii. 379. The ancient name of Bologna was *Felsina* from the Teutonic *fels* a hill. Denina, 289. The same author observes, p. 43, that *Ocellum*, or Oceglio, is from the Teutonic, *Hoch hell*, or high hill. These clear etymons are among the proofs that the Cisalpine Gauls were of German extract.

1,250,000. Florence long continued a discordant republic, till the house of Medici, originally opulent merchants, obtained the supreme power in the beginning of the fifteenth century. That family becoming extinct, 1737, was followed by Francis duke of Lorrain, who afterwards succeeded the house of Austria in the imperial throne. Francis was followed by his son Peter Leopold, emperor in 1790; whose son Francis became grand duke, and succeeded his father as emperor of Germany in 1792; his brother Ferdinand being appointed grand duke of Tuscany.* The revenue is computed at about half a million sterling, but the forces do not exceed 6 or 8,000. TUSCANY. Historical Epochs.

Tuscany is one of the most beautiful and fertile regions of Italy, with a temperate and healthy climate. It abounds in corn and cattle, and produces excellent wines and fruit.

Florence contains about 80,000 inhabitants, and Livorno (corrupted by our mariners to Leghorn) 45,000: the latter, a celebrated port, has supplanted the maritime city of Pisa, now reduced to a population of about 20,000. The manufactures of silk and velvet were formerly celebrated, and still maintain reputation.

The mountains in the Siennese, or southern part of Tuscany, contain valuable ores of antimony, copper which is wrought at Massa, and other metals, with slate and yellow marble. The serpentine of Impruneta, seven miles south from Florence, presents beautiful varieties used in ornamental architecture.[1] The Florentine marble is remarkable for picturesque representations of ruins, &c. caused by the infiltration of iron between the laminæ. The Arno receives many small streams; and the Ombrone is a considerable river which pervades the Siennese.

The small republic of Lucca is supposed to contain 120,000 people, on 288 square miles; of which Lucca holds about 40,000. It assumed independence in 1370, the present aristocratic constitution was ratified in 1430; but in the recent revolutions of Italy this state adopted a LUCCA.

* It is now a kingdom under the protection of France, assigned to a prince of Spain.

[1] Ferber, 250, &c. At Sienna are curious paintings representing the life of Pope Pius II. Æneas Sylvius.

Borax has been found in the lakes of Tuscany, near Sienna and Volterra.

constitution

LUCCA. constitution similar to the French.* The Luccanese are the most in trious people of Italy, and no spot of ground is neglected, the hills b covered with vines, olives, chesnut, and mulberry trees, while the dows near the coast nourish numerous cattle. Oil and silk are the exports of Lucca, and their motto is LIBERTAS, a goddess rarely fo more amiable than here. Lucca is now a principality, with the a tion of Massa Carrara, and Garfagnana.†

ST. MARINO. The diminutive republic of St. Marino has been celebrated by m able writers. The inhabitants of the village and mountain are c puted at 5000. It is surrounded by the dominions of the Pope, claims his protection. A hermit of the fifth century gave name existence to this village, which grew up unmolested on the ground. In 1739 the miserable ambition of cardinal Alberoni, b disappointed in embroiling large states, was directed against this s republic, which he subjected to Rome, but the revenue being in siderable its ancient privileges were restored.

PIOMBINO. The principality of Piombino, consisting of a small portion of Italian shore, and the opposite isle of Elba, were in the thirteenth tury subject to the Pisans; and after several revolutions passed to family of Appiano, as a detached principality, in 1399. In 150 was seized by Cæsar Borgia, but after the death of pope Alexander returned to the house of Appiano. In the sixteenth century the isl Elba was repeatedly ravaged by the Turks. The principality rece passed to the house of Buoncompagni, that is the dukes of Sora, a N politan family which owes its fortune to the pontiff Gregory

* Now a principality.

† Another small commercial republic, though situated on the eastern shore of the Adriat often considered as an Italian state. Ragusa has a population of about 56,000, on 352 s miles. This state being adjacent to the territory formerly belonging to the Venetians in matia, imitated the Venetian aristocracy, and was protected by the Turks on condition of p tribute. The religion is the Catholic; and the speech the Slavonic, but most of the inhab speak Italian. It is an archbishopric, with six suffragans, and its commerce is considerab it supplies the Turks with several kinds of merchandize and ammunition. Ragusa is an a city, being the Rausium of the Romans, and in the tenth century had become a metropo Dalmatia. In the thirteenth century it was conquered by the Venetians, and afterwards s for a time to the crown of Hungary. The history of Ragusa may be traced in that of Venice its manufactures are still of distinguished beauty. Lucii Dalmat. 49, &c. Busching, iii. 259.

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Piombino

Piombino is a small neglected town, the princes having generally resided at Rome. PIOMBINO.

The isle of Elba, the ancient Ilva, is about nine miles in length, and three in breadth; and has been remarkable from early antiquity for its metallic productions, particularly beautiful ores of iron, often crystallized, and mingled with native Prussian blue. The chief iron mine is that of Rio, worked like a quarry, in the eastern part of the isle; but as there is no water it is smelted near Piombino. This remarkable isle is also said to contain copper, lead, and even tin. Magnet, by the Italians styled calamita, is also found in great perfection; but what is styled white calamita seems to be a different substance. The coast of Campo contains granite, which according to Ferber is of a violet colour. Asbestos and amianthus are also among the productions of Elba. Ferber, himself a Swede, says that the iron ore of Elba is equal to that of Sweden. This isle produces excellent wine, some oil, and flax; but cannot boast of much fertility in grain.[2] ISLE OF ELBA.

[2] Busching, xiii. 125. Ferber's Italy, 294. Tozzetti, in his travels through Tuscany, supposes Elba to have furnished most of the granite used by the Romans. Vacca in his Account of the Antiquities of Rome, published by Montfaucon, repeatedly mentions the *marmor granitum Ilvaliæ insulæ*, thus indicating the opinion of his time that most of the granite was brought from the isle of Elba. This interesting island has since been annexed to the French empire.

CHAPTER IV.

The Northern Part of Italy.

Piedmont.—Milan.—Venice.—Mantua.—Parma and Placentia.—Modena.—Genoa.

THIS largeſt diviſion formerly compriſed the extenſive territories ſubject to Venice and the king of Sardinia, with Milan and Mantua appanages of the houſe of Auſtria, the principalities of Parma and Modena, and the long mountainous ſtrip belonging to the Genoeſe. But France has ſeized on Piedmont, Savoy, with the county of Nice, and ſmall principality of Monaco. This part of Italy therefore is now about 200 miles in length, from Carniola to Piedmont, and about 120 in breadth, from the gulph of Genoa to the Swiſs frontier. This fertile region was by the French conſtituted a republic, under the name of Ciſalpine, an erroneous application of the ancient name Ciſalpine Gaul; as on the contrary the proper appellation, derived, with the projected government, from France, ought to have been the Tranſalpine, or the Paduan republic, as the country is pervaded and fertilized by the Po.*

Extent.

Piedmont.

The moſt extenſive province of this diviſion is Piedmont, now regarded as a French acquiſition, ſtill about 150 Engliſh miles in length by 100 of medial breadth. This principality was part of the ancient kingdom of Lombardy, and formed a portion of the gradual acquiſitions of the counts afterwards dukes of Savoy, and latterly kings of Sardinia.

* Piedmont is excluded from this new republic; which on the other hand embraced the papal territories of Ferrara, Bologna, and Romagna. The reſt of Italy was once the Roman and Neapolitan republics. Venice is now annexed to the kingdom of Italy.

While

While the revenue of Sardinia was eſtimated at 1,085,000l., Piedmont contributed 953,750l., Savoy 87,500l., and Sardinia only 43,750l. This delightful province enjoys a mild and pure air, and diſtinguiſhed fertility of ſoil, the plains producing wheat, maiz, rice, with ſome olives and wine, and the paſturages abound with cattle. Mr. Young ſays in general that the ſoil is a rich ſandy loam, with ſome tracts of large gravel brought down from the rivers; but the heat is exceſſive in ſummer, and the winter cold very ſevere. Yet the ſilk is eſteemed of the fineſt quality. Keyſler mentions the fogs of autumn and winter, riſing from the Po and other waters. Around Turin and through a great part of the province, artificial irrigation, or the watering of meadows, is practiſed with great aſſiduity and ſucceſs.* PIEDMONT.

The ſurrounding Alps are rich in minerals.[1] The Alpine chain, from St. Gothard to Mount Cenis, is of prodigious height, particularly Mount Roſa, a northern boundary of Piedmont, and ſuppoſed to be the ancient Mons Sylvius; but from Mount Cenis it becomes gradually lower, till the Apennines branch out between Roja and Livenza, encloſing this province on the ſouth. Thus numerous ſtreams deſcend on all hands to fertilize the plains, and the river Orco forms at Ceresoli a vertical caſcade, computed at 400 fathoms or 2,400 feet. The torrent Evenſon, deſcending from Mount Roſa, forms about half a mile from Verrez, a fall of more than 200 fathoms. The copper mines in the duchy of Aoſta are numerous; and in ſome places this metal is accompanied with antimony, arſenic, and zinc. In the ſuperior regions near Macugnaga there are mines of gold, found in marcaſite and quartz: in the vale of Seſia are the gold mines of St. Maria, and Cavavecchia, alſo containing ſilver. Gold is likewiſe found in the mountains of Challand near the vale of Aoſta; and the torrent Evenſon rolls down pebbles of quartz, veined with that precious metal. Not far to the eaſt of Mount Blanc, a

* Denina obſerves, that the abundance of the market of Turin indicates the ſurpriſing opulence of the country. *Tableau de la Haute Italie*, Paris, 1805, 8vo. p. 8. Orgeat is made of the ſeeds of melons. Ib. 55.

[1] See Memoire de M. Robilant ſur la minéralogie de Piémont, Journ. des Mines, No. 50.

In the valley of Suſa, Piedmont, there are curious variolites; and green porphyry appears near Mont Viſo. *Journal des Mines*, No. 61. *Verde antico* is ſaid to be found at Buſſolin near Suſa.

Piedmont. rich vein of cobalt has been recently discovered; and plumbago or black lead has been observed near the baths of Binay. But it would be infinite to detail the mineralogic opulence of Piedmont, which spreading to the south of the highest Alps, almost rivals the southern side of the Carpathians in Hungary.

The chief city of Piedmont is Turin, supposed to contain more than 80,000 inhabitants, with an university founded in 1405 by Amadeo duke of Savoy,* this city having been subject to the family since A. D. 1097. Vercelli is said to contain 20,000; and Alessandria 12,000: a little to the east of the latter is Marengo, noted for a victory of Bonaparte over the Austrians. The king of Sardinia used to maintain an army of about 40,000. The chief exports consist of silk, which was chiefly manufactured at Lyons, some hemp, and large flocks of cattle.

Milan. Next in position, and now in consequence, is the fertile duchy of Milan, said to contain, on 2,432 square miles, a population of 1,116,850. The city of Milan was founded by the Gauls about 584 years before the Christian era; and the inhabitants are computed at about 120,000. After the fall of the kingdom of Lombardy, it became subject to the emperors of the west; but impatient of the yoke, it was severely punished by the emperor Frederic I. 1162; who taking it after a siege of seven months destroyed the gates, ramparts, and edifices, except a few churches, and sowed salt on the ruins. Recovering slowly, amid the contests between the emperors and the popes, it however could not assert the form of a republic, but became subject to the archbishop, and to the Torriani. Napoleon Torre opposing Otto Visconti, archbishop of Milan, was defeated in 1277, and the prelate was proclaimed temporal lord of Milan. He was succeeded by his nephew; and the family of Visconti long possessed this opulent principality. In 1368 Yolande daughter of Galeazzo was married to Lionel duke of Clarence son of the English monarch. This family expired in 1494; and was followed by Sforza, and by the French kings. In 1535 Charles V seized Milan, as a fief of the empire, and gave it to his son Philip; whose successors,

Historical Epochs.

* The citadel was built by Faciotto d'Urbino, the architect of that of Antwerp. *Tableau de la Haute Italie*, Paris, 1805, 8vo. p. 13.

kings of Spain, held the Milanese till 1706, when it became an appanage of Austria; but a considerable part had passed to the house of Sardinia. The revenues of this duchy are computed at about 300,000l. MILANESE.

At Pavia is an university of great repute, the professors having much distinguished themselves in natural history. It is regarded as the first in Italy. There are manufactures of wool and silk, but the latter is inferior to that of Piedmont: there are also numerous workmen in gold, silver, embroidery, steel, and in crystal, agate, aventurine, and other stones, so that the country swarms with artisans.

Mr. Young[2] represents the soil as being chiefly strong loam, or loamy sand; and the most remarkable circumstance in the climate is the mildness and warmth of the northern mountainous tracts, and the cold felt in the plains. Orange and lemon trees flourish in the open air on the western side of the lake of Como, though bounded by the high Alps, which to the north are covered with eternal snow; while in the plain of Lombardy, even to the Apennines, these trees require shelter. The Boromean isles also, in the Lago Maggiore, are covered with these delicate trees. In Parma severe frosts are felt, which are not unknown in Tuscany, and even at Rome. The lands in the Milanese, as in Piedmont, are mostly enclosed; and the farmers were metayers upon the old French plan, the landlord paying the taxes and repairs, the tenant providing cattle, implements, and seed; and the produce being divided between them: a miserable system which greatly impeded agriculture. The irrigation of the Milanese Mr. Young represents as a stupendous effort of industry; and the canals for this purpose are mentioned as early as the eleventh century; some of them being more than 30 miles long, and near 50 feet wide. The price of land is nearly 100l. the acre, and yields about three per cent interest. The cattle, dairies, and cheese, excellent; but the sheep few and bad. Though the Milanese border, towards the north, on the higher Alps, and might thence be supposed to rival Piedmont, yet the mineralogy has been little explored, as the house of Austria possesses abundance of ancient and productive mines. Yet Climate.

[2] France, ii. 148.

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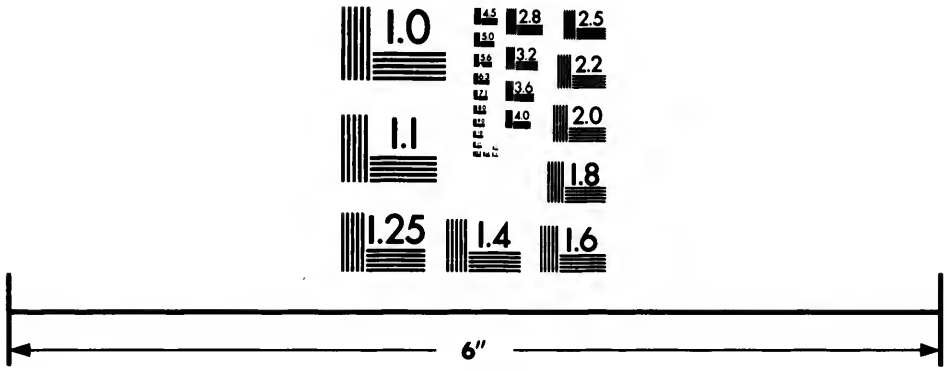

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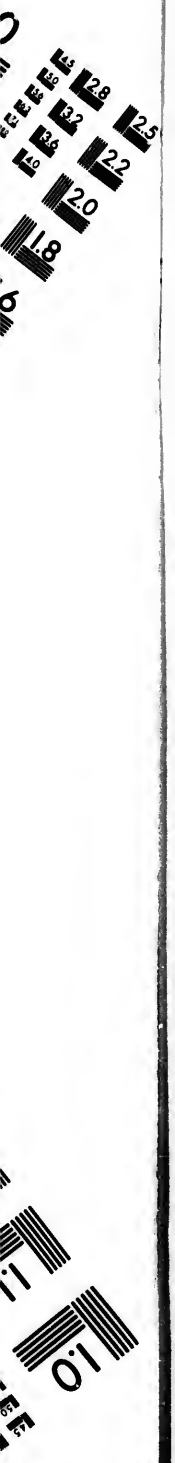
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MILANESE. there are ſome mines of copper and lead above the lake of Como, and the mountains, and Boromean iſles preſent fleſh-coloured granite. Lapis ollaris abounds near Como.[3]

Venice. The Venetian territory has been recently withdrawn from the houſe of Auſtria, and annexed to the new kingdom of Italy. A deſcription of the well-known city of Venice would be ſuperfluous: nor is it neceſſary to enlarge on the well known antiquities of Verona, and the univerſity of Padua.*

The ancient and remarkable city of Venice, was founded in the fifth century by the Veneti of the oppoſite ſhore, who fled from the incurſions of the barbarians. At firſt each iſle was governed by a tribune, till the year 697, when the firſt doge was elected. In the ninth and tenth centuries the government of doges became nearly hereditary, but in the eleventh the election again became open. Towards the cloſe of the twelfth century, the democratic form was ſucceeded by an election, and adminiſtration ſeverely ariſtocratic, and well known by its ſingularity and ſtability. The Venetians having gradually extended their power along the Adriatic, in the year 1204, became maſters of ſeveral Grecian provinces, and iſlands; and after their conteſts with the Piſans, and Genoeſe, became the firſt commercial and maritime power in Europe, till the end of the fifteenth century, when the diſcovery of the Cape of Good Hope transferred the oriental traffic to the Portugueſe, who were ſucceeded in maritime exertion by the Spaniards and Dutch; and, laſtly, by the Engliſh, whoſe naval tranſcendancy exceeds all ancient or modern example. The authority of Venice declined with its commerce; and the republic may be ſaid to have expired of mere old age.†

The

[3] Ferber's Italy, 315.

* Livy was a native of Apone in the Euganean hill.

† A celebrated traveller, who reſided four months at Venice, while that city was under the Auſtrian government, aſſures me, that the government was purely military, and highly contemptuous to that ancient and venerable republic, which would have been treated with reſpect by a conqueror of any ſenſibility. The old courts of juſtice were aboliſhed, and the members of the new inferior courts of *prima inſtanza*, &c. very ignorant and corrupt. A conſiderable part of the grand canal had fallen in, and no repairs were made, ſo that the mouth of the harbour was greatly impeded. The infatuation went ſo far as utterly to neglect Venice, becauſe it was formerly the rival of Trieſte! The citizens were inſulted by ſoldiers, paſſing in double files through the narrow ſtreets, while the

The commerce of Venice had ſunk in great decline. The remaining trade of that city chiefly conſiſted in ſcarlet cloth, and in ſtuffs inwoven with gold and ſilver, ſold to much advantage in the Levant; and the Venetian mirrors retain their ancient reputation; but the city did not exiſt ſo much by immediate commerce, as by the vaſt wealth acquired during a long period of proſperity. Venice.

The Venetian territory preſents many conſiderable hills, branching from the Swiſs and Tyroleſe Alps. A minute enumeration would be ſuperfluous; but Mount Baldo, on the eaſt of the lake Garda, muſt not be omitted, having become remarkable among botaniſts by a variety of curious plants. Mount Bolca, fifty miles N. W. of Venice, is noted for foſſil fiſh in argillaceous ſchiſtus. The Euganean hills, near Padua have been ſuppoſed to be volcanic.*

The Adige ſprings from the Rhætian Alps, and being joined by the Eiſac on the E. pervades the S. of Tyrol and Trent, then flows by Verona towards the Adriatic, which it joins only about ten miles to the N. of the Po. The Tagliamento, Piave, and Brenta, all ſpring from the Tyroleſe Alps.† Rivers.

The ſmall duchy of Mantua was held by the houſe of Gonzaga, from the fourteenth century; but the laſt of the family being put to the ban of the empire, Mantua has been ſubject to Auſtria, ſince the Mantua.

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the officers would enter the ſhops, and ſtrike reſpectable ſhopkeepers without any provocation. That brutal pride which has been imputed to the Auſtrians was never more apparent: The whole revenue of Venice for three years could not repair the dilapidations. The palaces are deſerted, the great nobles living in caſinos to avoid extortion and ſuſpicion, while the ſmaller are often clerks in the public offices. It needs not be added, that the Auſtrian power was deteſted.

* The green earth of Verona is found near the village of Brentonico, in ſlits of a calcareous rock. La Lande, ix. 251.

† Of the Venetian iſles in the Adriatic, and the coaſt from Zara to Narenta, &c. that of Veglia is of ſmall account. Cherſo, and Oſero, being only divided by a narrow ſtrait, are regarded as one iſle, woody and fertile: Pago is barren: Iſola Groſſa, and ſome of the others more fertile: Leſina is remarkable for the fiſhery of *Sardines*; Curzola ſerved the Venetians as an arſenal of ſhip timber. Meleda, and ſome ſmaller iſles, belong to the republic of Raguſa. The deſcription of Dalmatia by the Abbé Fortis is feeble, confuſed, and prolix: the beſt is that by Lucius, Amſt. 1668, fol. which alſo contains the original hiſtorians. The perpetual cuſtom of modern travellers in purſuing beaten routes prevents many diſcoveries, and obſtructs the progreſs of geography. Of this coaſt, for inſtance, and the weſt of Greece, our knowledge remains imperfect.

MANTUA. year 1707, and was ruled by the governor-general of the Milanese. The capital ſtands on a lake formed by the Mincio, and was formerly ſuppoſed to contain 50,000 inhabitants, now reduced to about 12,000; the poſition and fortifications render it a place of great ſtrength. The Venetian territory to the weſt of the Adige conſiſted chiefly of the Breſcian and Bergameſe, the latter being mountainous; but the Breſcian is fertile in wine, oil, and maiz, with excellent paſturages, and ſome mines of copper and iron.*

Parma and Placentia.

The territories of Parma and Placentia have been conjoined for many ages. They were conteſted by the Lombards, and by the Exarchs of Ravenna; and after many revolutions ſubjected themſelves to the papal ſee, whence they were transferred by Paul III. in favour of his ſon Pietro Farneſe, in 1545. This family being extinct in 1731, after ſome conteſt, the duchies of Parma and Placentia were finally aſſigned to the Bourbon family of Spain. The population is computed at 300,000; the revenue 175,000l.

Parma is a conſiderable city with ſome manufactures, and an academy of painting; the printing preſs eſtabliſhed by Bodoni was diſtin-

* The kingdom of Italy now includes all the northern parts; except Piedmont and Genoa, which belong to the French Empire.

Before the addition of Venice the kingdom of Italy, divided into twelve departments, contained 3,552,555 inhabitants.

The department of Agogna, comprehending the two provinces of Upper and Lower Novareſe	346,213
Lario, or Como, and its diſtricts	371,894
Olona, comprehending Milan, Pavia, &c.	346,234
Serio, or the Bergamaſque	294,142
Mella, or the Breſſan	333,625
Alto-Po, or the Cremoneſe	361,079
Mincio, the Mantuan	290,489
Croſtolo, Reggio, and Maſſa Carrara	179,795
Panaro, the Modeneſe, and the Garfagnana	200,170
Baſſo-Po, the Ferrareſe, Comachio, and Rovigo	227,500
Reno, the Bologneſe with Imola	421,841
Rubicone, the Romagna	269,373
Total	3,552,555

Denina, 302.

The population of the Venetian territories has been computed at 1,800,000.

guiſhed

guiſhed for beautiful productions. Both Parma and Placentia have universities. The ſoil is a rich ſandy or gravelly loam, with fine paſtures; and the Parmeſan cheeſe now made at Lodi in the Milaneſe has been celebrated for many centuries.[4] The farms are ſmall and agriculture ill conducted, irrigation being here little practiſed. The ſheep are bad, and the wool like hair. The improvement of the country was much neglected by the Bourbon family. PARMA AND PLACENTIA

The duchy of Modena is a remnant of the power of the celebrated family of Eſte, who alſo poſſeſſed the adjacent country of Ferrara, ſeized by the pope in 1598. The remaining territory contains about 320,000 ſouls, and the city of Modena 30,000; the revenue 140,000l. The ſoil reſembles that of the duchy of Parma; and the agriculture is little ſuperior, the middle-men and metayers impeding induſtry, but ſome peaſants in the mountains are proprietors of land. The breed of ſheep is neglected. It is remarkable that in digging wells near Modena, at a certain depth, a particular ſtratum is found, which being paſſed, the water guſhes up as from a ſubterranean lake or river. About ten miles to the ſouth of the capital there is an aperture in the earth called La Salza, whence, particularly in the ſpring and autumn, aſcends ſmoke, flame, aſhes, and ſtones, with a ſtrong ſmell of ſulphur. Carrara in the S. of this duchy affords the celebrated marble uſed in ſtatuary. Modena. Natural Curioſities.

The imperial fiefs, and ſmaller ſtates, in this part of Italy, would little merit deſcription, eſpecially in the midſt of the preſent revolution. This account ſhall therefore cloſe with the republic of Genoa, conſiſting of a long mountainous tract, formerly noted for the acuteneſs and treachery of the Ligurians its inhabitants. The city of *Genua* was deſtroyed by Mago the Carthaginian general, and rebuilt by the Romans. It afterwards became ſubject to the Lombards, and the emperors of Germany; but in 806 had ſeized Corſica, and in the eleventh and twelfth centuries was diſtinguiſhed in the Cruſades, the Genoeſe rendering themſelves maſters of the Black Sea, with Genoa. Hiſtorical Epochs.

[4] Young's France, ii. 148. There are iron founderies near the Apennines. Keyſler, iv. 113.

eſtabliſh-

GENOA. eſtabliſhments in the Crimea, and in the ſuburbs of Pera at Conſtantinople, where they remained till the Turks took that city.[1] Genoa ſtrongly conteſted with Venice the dominion of the ſea; and the war was not terminated till 1381. In 1471 the Genoeſe were expelled from the Crimea; but their maritime power continued reſpectable. The form of government was more democratic than that of Venice, ſo that the latter had a more firm executive effect. Exhauſted by the Venetian war, Genoa offered voluntary ſubjection to France and Milan; but in 1528 Andrew Doria delivered his country, and introduced a more ſtable and ariſtocratic government, which continued till 1798, when the French form was choſen, and the new ſtyle aſſumed of the Ligurian republic, confirmed by the recent treaty of February 1801. In 1730 Corſica revolted from Genoa, and has not ſince been reſtored. In 1745 the Genoeſe declared war againſt the king of Sardinia, but ſuffered greatly in the conteſt.

The papal power is here little venerated, the people being immerſed in buſineſs, and receiving monied heretics with open arms. The population of the territory is computed at 400,000; of the city at 80,000. The troops, including the country militia, may amount to 30,000; but the powerful fleets have ſunk to a few gallies. The air is pure and ſalubrious, and there are excellent fruits and vegetables; but the grain is not ſufficient for the conſumption. The manufactures are chiefly of ſilk and velvet. The Apennines, which encloſe this region, are in ſome places covered with foreſts, but in others are barren rocks, while in a few they afford delicious paſturage. They ſupply excellent marble for the proud palaces of Genoa; while Polzevera in the Bocchetta yields the beautiful ſtone ſo called, being ſerpentine of various colours veined with marble. In 1778 a magnificent road was made from the Bochetta or mountains to the north of Genoa, through the Polzevera, which for the ſpace of three years employed from 5 to 800 men, by the patriotic muni-

[1] See Gibbon, xi. 390.

ficence

ficence of one noble family the Cambiasi.[6] The siege, in 1799, was very destructive. GENOA.

This brief account of the northern division of Italy must not be closed without remarking, that the Cisalpine, or rather Transalpine or Paduan, republic, was re-established by the treaty of Luneville, 9th Feb. 1801. By art. xii. that republic was again acknowledged, as constituted by art. viii. of the treaty of Campo Formio.*

ITALIAN ISLANDS.

The description of the island of Sicily has been incorporated with that of the kingdom of Naples, and that of the smaller isles with the adjacent shores, but Sardinia and Corsica may be regarded as detached Italian islands.

The king of Sardinia has lost all his possessions, except this island, of which a good description has been lately published by Azuni. The population, in 1790, amounted to 456,990 souls, that of Cagliari the chief city being about 30,000. Among the animals are said to be wild horses of a very small size. This island seems capable of great improvement; and probably the same impediment prevails as in Corsica, where the lands belonging to the community, and not to private proprietors, are utterly neglected, and left as it were in a state of nature. The first and indispensable step, therefore, for the improvement and civilization of these islands would be, by a strong armed force, to divide them into estates of a moderate size, among the most able and powerful men in each community; and to spare no means of instructing the in- SARDINIA.

[6] Stolberg, i. 215. Colon is said to have been born at the castle of Cucaro in Montserrat. Denina, 88. But from a solemn testimonial, in a law-suit for the estate of Veragua, it is evinced that the great Colon was not a Genoese, but a Ferrarese. Estalla, *Viagero Universal*, xi. 258.

* This Volume was written in the year 1800, and retouched in 1801. At present the new republic forms a part of the kingdom of Italy.

SARDINIA. habitants in their real interests, the pursuits of industry, which ought to be rewarded by lands reserved for that purpose.

The two chief rivers of Sardinia are the Oristano, running about eighty miles, and the Flumendoso, passing in opposite directions E. and W., and dividing the island into two portions. The mountains run N. and S., the highest being Limbara, Villanova, Arizzo, and Fonni, of which the summits are generally covered with snow. The chief plains are towards the south, and are tolerably fertile in wheat, of which a considerable quantity is exported, barley, beans lentiles, &c. Among the wines the most esteemed is that of Nasco. There are groves of wild olive trees; and the orange, lemon, pomegranate, jujub, and other fruit trees are common, while the tall palm decorates the forests.

The wild horses are chiefly found in the territories of Bultei and Nurra; and still more numerous in the isle of St. Antico in the forest of Canais: they are very small, but extremely well made, and active. This singular circumstance has escaped the attention of naturalists. Rams sometimes have from four to six horns. Small deer are not uncommon, and the boar is particularly numerous and terrible. Nor must the wild sheep be omitted, which inhabits the most solitary parts of the mountains, and sometimes engenders with the tame. For the animals of Sardinia, Cetti may be consulted. The tunny fishery is of considerable importance; but anchovies are rare, as are sardines, though they seem to have formerly abounded, and to have received their name from the island; nor must the coral fishery be omitted.

Among the minerals the chief is silver, of which there are several mines, as those of Guspini, Arbus, Argentera, &c. but the leads mines are the most productive, and those of Iglesias are said to yield from sixty to eighty pounds in the hundred weight, being in hills of argillaceous schistus, and limestone, while the most common gangart is barytes. The product of the mines is computed at 321,000 francs. In the northern mountains are found carnelians, calcedonies, agates, turquoises, &c. but the sardonix is as rare as the sardine, and the former probably derived its name from the inland city of Sardes in Lydia. The mountains

mountains of Nurra abound in porphyry, while granite is chiefly found in those of Gallura, and seems to have been used by the Romans. SARDINIA.

The dress of the Sardinians is a vest of white or scarlet woollen, covered with a large coat or jacket, without sleeves, composed of four sheep skins. The dress of the women has nothing particular. The Italian language begins to prevail; but the ancient dialect seems a mixture of the languages of the various conquerors. The original inhabitants, like those of Corsica, were probably Iberi from Spain. The revenues are computed by Azuni at 1,695,062 francs. The exports about 8,000,000 livres; and the imports two millions. The religion is the Roman Catholic, and it is singular that with six bishoprics there are three archbishoprics.*

Mr. Young † informs us, seemingly from good authority, that this isle has been shamefully neglected by the government; for, exclusive of the mountains, the whole country may be regarded as waste and only cultivated in a few spots. The chief proprietors are absentees, and the peasantry crushed by rapacious stewards; the number of inhabitants about 450,000. The frequent wastes abound with wild ducks; but the number of cattle and sheep is deplorably small, and the morasses produce most pernicious exhalations.

Of the island of Corsica a brief account has been given at the end of the description of France, to which country it is now subject. But as this island, in strict geography, belongs to that division of Europe called Italy, it may not be improper to add some information concerning its topography and natural history, the last in particular, being intimately connected with its climate and geographical position. Corsica.

The most remarkable mountains of Corsica, are Monte Rotondo, Monte d'Oro, and Monte Cinto: the summit of the first is 1449 fathoms above the level of the sea. There are two small lakes, the Ino, and the Creno, on Monte Rotondo: the diameter of Lake Ino is 160 fathoms; its depth is unknown.‡ The height of Monte d'Oro is 1361 fathoms.

* *Walckenaer's Notes on the French translation of this work*, iii. 600.

† Journey in France, ii. 257.

‡ They are not observable in the excellent map by Bacler d'Albe.

CORSICA. Thefe mountains are fituated nearly in the centre of the great chain of granite, which traverfes the ifland from north to fouth. On this chain recline mountains of the fecond and third order, which decreafe gradually in height to the fea without exception, fave on the eaftern fhore of Corfica, to Baftia. Moft of thefe mountains are covered with fnow during the winter: the fnow even lies all the year in the receffes. The vallies are in different directions; but the farther from the principal chain, the more their aperture is directed towards the fea. Thofe on the fides vary in their refpective correfpondence; the receding and falient angles do not obferve a conftant pofition with thofe of the oppofite fide. The vallies in general are narrow, and not deep at the upper part; but they increafe in breadth and depth as they defcend. The fides of the mountains are moftly covered with forefts compofed of *quercus ilex*, *quercus fuber*, *pinus larix*, and *pinus abies;* the latter being very beautiful.* The vegetable earth, in the part comprehended between Calvi, Baftia, Corte, and Cervione, in general refts on a bafis of fchiftus, or on calcareous rocks of different qualities. The fchiftus near the fea-fhore is that known by the name of hard argillaceous fchiftus; it is always interfected with veins of white quartz, which penetrate the whole depth of its beds. It is not uncommon to find a kernel of calcareous fpar environed with a ferruginous earth; but it does not exhibit any trace of organic bodies. In the other parts of the ifland, granite is found in great maffes, currents of lavas, fometimes mixed with felfpar, fometimes with a black fubftance, and often with both; jafpers and porphyry are alfo found: the fingular rock known by the name of globular granite of Corfica, deferves all the attention of geologifts. The Fiumorbo, the environs of Baftia, the cape of Corfica, and the Nebbio, furnifh pot-ftones, ferpentines, afbeftos, variolites; and amianthus in fuch quantities that they make paper from it. Beautiful marble is alfo brought from the environs of Corte; and near the village

* Vines, olives, and mulberry trees for the produce of filk, may be recommended as great objects of cultivation.

of

of Moltifao, canton of Caccia, there are ſigns of copper and lead mines.* CORSICA.

* Walckenaer's Notes on this Geography, Fr. ed. tome i. p. 221.

Dolomieu, in the moſt intereſting of his productions, his Diſſertation on Rocks, to be found in the *Journal de Phyſique*, vol. xxxix. 1791, xl. 1792, and the New Series, vol. i. p. 195, has obſerved that the rocks of Corſica are often porphyro-granitic, granite ſometimes paſſing into porphyry, if among the ſmall grains of felſpar there be ſome large and diſtinct. But this remark is inexact, as trap is now known to form the baſis of porphyry, and the rocks above deſcribed belong to another claſs. He deſcribes, p. 247, the porphyries of the valley of Niolo in Corſica, which have often been confounded with agates and jaſpers, on account of their fine grain and diverſity of colour. In Niolo are alſo found vaſt blocks of green petroſilex ſpotted with red felſpar.

In the violet granite of Corſica the felſpar is in large cryſtals of a violet colour. *Buffon, Mineralogie*, Paris 1783, 4to. i. 115. The richeſt coral rocks are between Sardinia and Corſica. Ibid. iv. 150.

The mines of the celebrated Corſican green ſtone, which, according to Sauſſure, is a mixture of jad and ſmaragdite, but according to Werner, of petroſilex and actinote, are near Alezani. *Journal des Mines*, No. 65. Silver occurs near Caccia, Farinole, and Galeria. Ib.

Barral, in his Mineralogy of Corſica, 1783, p. 31, indicates mountains near Fiumorbo of ſerpentine in globules, the ſize of nuts with concentric zones, ſtripes, &c. At cape Corſo octadral cryſtals of iron occur in chlorite ſchiſtus.

Of the beautiful ocular granite only a large block was found near Olmetto. See a memoir of the venerable mineralogiſt Beſſon, *J. de Phyſ.* 1789.

SUPPLEMENT

SUPPLEMENT TO ITALY.

VENETIAN DALMATIA.—RAGUSA.

VENETIAN DALMATIA.

THE want of ſome account of Dalmatia having been regarded as an imperfection in the preſent work, this is the proper place to ſupply that deficiency, as the chief poſſeſſors were the Venetians, and even the independent republic of Raguſa bears the name and form of an Italian ſtate. Independent of the Turkiſh empire in Europe, the Dalmatian provinces cannot be juſtly arranged under that diviſion. The Auſtrian government with the grand maritime city of Venice, alſo acquired theſe valuable territories; but from an unaccountable imbecility treated Venice and her poſſeſſions, which in any other hands would have been equal in value to the loſt Netherlands, with ſuch contempt and neglect, by a fatal routine in favour of the old Auſtrian port of Trieſte, that impartial Europe was filled with aſtoniſhment.

It is unneceſſary to trace the ancient geography of Liburnia and Dalmatia, or the ancient names and diviſions of Albania. The inhabitants, moſtly ſcattered over mountains, have been computed at about ſixty thouſand. The Montenegrins, ſo called from the Moute Negro or Black Mountain near Cattaro, have been reckoned among the moſt daring; while the fame of Scanderberg has reflected glory on Albania. All profeſs the Greek religion, but with ſeveral remains of pagan ſuperſtition, which may be traced in the travels of Fortis. The Morlacs, and other inland tribes

tribes of Dalmatia, are honeſt and ſincere barbarians; and the dreſs of their vaivods ſomewhat reſembles the Hungarian.* VENETIAN DALMATIA.

That portion of Dalmatia which formerly belonged to the Venetians is full of little caſtles and forts in the old ſtyle. The inhabitants are not only bold, but often ſkilful mariners, and are rather to be ruled by mildneſs than ſeverity. They are attached to their chiefs and their privileges; and Venice ſecured their fidelity by moderate taxation, and plentiful ſupplies of proviſions, for the country is generally barren.

The chief town is Zara, the ancient Jadera, formerly conteſted between the Venetians and Hungarians, but poſſeſſed by the former ſince 1409. Zara is one of the ſtrongeſt places in Dalmatia, being ſurrounded by the ſea, except on the E. where there is a draw-bridge and fortreſs. There is alſo a citadel, with a deep ditch cut in the rock. The port is towards the N. ſpacious and well defended; but there being a deficiency of water, the rain is preſerved in ciſterns. It was formerly the reſidence of the governor of Dalmatia; and is an archbiſhopric ſince 1154, the biſhops of Alba, Vegia, and Oſero being ſuffragans. There are ſome remains of Roman antiquity. In commerce, Zara is chiefly noted for maraſquino, the moſt celebrated of all liqueurs, and which is diſtilled from the kernels of a kind of cherry. Towns. Zara.

Aurana is one of the moſt delightful towns of Dalmatia, being ſituated on a lake of the ſame name. It is fortified, and was a conſiderable time in the hands of the Turks, but retaken in 1684. Knin, otherwiſe Clin, or Tinen, is a fortified town on a hill, upon the very frontiers of Boſnia and Dalmatia. It is ſtrengthened by a deep ditch, ſupplied with water by two rivers in the neighbourhood. It has been frequently ſeized by the Turks; and the final poſſeſſion by the Vene- Knin.

* The people of Albania are called Arnauts by the Turks, and lately diſtinguiſhed themſelves in Egypt. The interior of Dalmatia, on the S. of Boſnia, ſubject to the Turks, has been called Herzgovina, or Herſek, Buſch. iii. 364. Fr. tr. which others call the country of Moſtar, from the capital which ſtands on the river Narents, where it is paſſed on an ancient Roman bridge. Moſtar was formerly celebrated for a manufacture of arms, reſembling thoſe of Damaſcus. The old bans, or chiefs of Boſnia, were vaſſals of the kings of Hungary, formerly maſters of Dalmatia; nor was Boſnia ſubdued by the Turks till 1522. Upper Boſnia, alſo called Herzgovina, or the Duchy of St. Sabas, was diſmembered in the fifteenth century by Frederic III, king of Hungary, but was ſoon ſwallowed up in the Turkiſh conqueſts. The chief towns of Herzgovina are, Narona, or Narents, formerly the capital, Imos, Varboſania, Moſtar, and Klinova.

tians

Towns. tians only dates from 1688. Sebenico is a ſtrong maritime town, with a large haven and four forts. The church of St. John, in the citadel, is a fair edifice of marble. It has been four times beſieged by the Turks without ſucceſs, the Venetians having held poſſeſſion ſince 1412.

Trau. Trau is alſo well fortified, and is a pleaſant town with a ſuburb in the iſle of Bua. The haven is commodious, and ſheltered by two promontories.

Salona was the reſidence of the old kings of Illyria, and afterwards of the Roman prefects, and of the queſtors who received the revenues of the rich mines of Dalmatia. It was a ſtation of the Roman fleets, but is now greatly reduced. Spalatro, a maritime town, is well fortified, but commanded by adjacent hills. It is the ſeat of an archbiſhopric, and a mart of the Levant trade, with a large haven, and a lazaretto. The ruins of the palace of Dioclefian are celebrated. Spalatro has belonged to the Venetians ſince 1420.

Spalatro.

Detached from theſe provinces, and at a conſiderable diſtance towards the South, in the province of Herzgovina (alſo called that of St. Sabas, becauſe that ſaint was there buried), the Venetians poſſeſſed Caſtel Nuovo, once capital of the duchy of Herzgovina, and one of the moſt important fortified places in Dalmatia, being on a high rock near the ſea-ſhore. Cattaro is ſurrounded with mountains, which almoſt exclude the view of the ſun. It is tolerably fortified, with a ſtrong caſtle on an eminence; and has been ſubject to the Venetians ſince 1418. In 1806 it was diſputed by the Ruſſians and French. Theſe diſtricts are detached from the former by the territories of Raguſa.

Cattaro.

Iſles. The moſt remarkable iſlands formerly belonging to Venice are Oſero, Cherſo, Veglia, Pago, Leſina, and Curzola or Corcyra Nigra. Many of theſe iſles are fertile in wine and olives, with figs and other fruits: and have been briefly deſcribed in a note on Italy. Near Leſina there is a famous fiſhery of ſardines, which uſed to ſupply great part of Greece and Italy. The Turks having attacked Curzola, in 1751, were effectually reſiſted by the women, after the men had fled. The calcareous hills and iſlands of Dalmatia preſent ſome ſingularities; as the lake Jeſero in the iſle of Cherſo, which only diffuſes its waters every

fifth year;* ſeveral curious caverns; and prodigious quantities of foſſil bones, of horſes, oxen, ſheep, &c. but doubtful if any be human; nor have any decidedly ſuch, been diſcovered in any region of the globe. Istra.

The Venetians alſo poſſeſſed ſome towns in Albania, as Larda a conſiderable place on a gulf of the ſame name; Voinizza on the ſame gulf near cape Figolo, oppoſite to the famous promontory of Actium where Auguſtus defeated Mark Anthony; Preveſa, a ſea port town; and Butrinto, which is of little conſequence. Among the Venetian poſſeſſions were alſo the iſlands of Corfou, Cefalonia, with others in that quarter lately erected into a ſeparate republic.

Republic of Raguſa.

This little republic has been briefly mentioned in a note on Italy. The government is an ariſtocracy; and the chief magiſtrate, called the rector, is changed every month, an inſtitution of ſingular jealouſy. There is alſo a council of ten; and a great council compoſed of all the nobles above twenty years of age, who name the *pregadi*, or ſenate of ſixty, which directs all ſtate affairs, receives and ſends ambaſſadors, and beſtows offices. The revenue of Raguſa was formerly computed at a ton of gold, or about ten thouſand pounds ſterling. This little republic has found it neceſſary to court the protection of the Turks, and pays a tribute of about twenty thouſand ſequins, though the commerce be of uſe to the Ottomans in ſupplying them with ammunition. Jealous of their neighbours, the citizens of Raguſa only permit the gates to be opened a few hours of the day. It is a well built city, and the commerce not inconſiderable. The harbour might be rendered capable of a firm defence; and the circumjacent iſles are beautified by nature and art. The earthquakes have however been terrible, that of 1667 having deſtroyed ſix thouſand perſons. The Raguſans have many country houſes at Gravoſa, another ſea-port town. Stagno is another little town ſubject to Raguſa.

* Fortis, 429.

RAGUSA. Ragusa. Of the Rugasan isles the chief is Milet, or Melada, fertile in oranges, lemons, and good wine. On the N. there is a tolerable haven, with a town of the same name. Three or four little isles in that neighbourhood also acknowledge the sovereignty of Ragusa.

ZOOLOGICAL

ZOOLOGICAL REMARKS,

By Dr. SHAW.

EUROPE.

BRITAIN.

AMONG the rarer animals of Britain may be numbered the *Sorex bicolor*, or Water-Shrew, a larger ſpecies than the common Shrew, or *Sorex erinaceus*, and of a different colour, viz.: black above, and whitiſh below. It inhabits the banks of rivulets. BRITAIN.

Beſides the common Bat, we have the *Veſpertilio auritus*, diſtinguiſhed by the vaſt ſize of its ears; the *V. noctula*, or great Bat, meaſuring fifteen inches in extent of wings; and the *V. ferrum equinum*, or Horſe-ſhoe Bat, diſtinguiſhed by a horſe-ſhoe ſhaped membrane at the tip of the noſe.

The *Mus meſſorius*, or Harveſt Mouſe, a beautiful little ſpecies, not much more than half the ſize of the common mouſe, and of a reddiſh-brown colour above, and white below: it is particularly ſeen in Hampſhire, and faſtens its neſt, at a conſiderable diſtance from the ground, to the ſtems of thiſtles and other plants growing near each other.

Among birds, the beautiful *Merops apiaſter*, or Bee-Eater has been ſometimes ſeen, a flock of not leſs than twenty having been obſerved in Norfolk. The Hoopoe and the Roſe-coloured Ouzel are alſo occaſional viſitants.

The *Crane*, which is ſuppoſed to have been once common, has forſaken the iſland, appearing only as an occaſional ſtraggler from other regions.

The *Motacilla arundinacea*, or Reed Wren, is of the ſize of the Willow Wren, and of a greeniſh olive-brown colour above, and tawny-white beneath; the chin is white: this bird ſeems firſt to have been no-

BRITAIN.

ticed by the late Mr. Lightfoot, who discovered it in reedy situations about the river Coln, in Buckinghamshire.

Motacilla Dartfordiensis, or Dartford Warbler, is occasionally met with in some parts of England. It is somewhat larger than the Willow Wren, and of a dusky reddish-brown colour, with the middle of the belly white: the eyes red, and the eyelids deep crimson.

Motacilla Sylviella, or Lesser White-Throat, is also of the size of the Willow Wren, and of a cinereous brown colour above, and whitish beneath. This also was first observed, as a British species, by Mr. Lightfoot, who found it near Bulstrode in Buckinghamshire, where it builds its nest in low bushes. It has been supposed to be the *Motacilla Sylvia* of Linnæus.

Charadrius Himantopus, a beautiful species of the Plover tribe, of a white colour, with the wings and tail black, glossed with green, is remarkable for the excessive length of its bright red legs, and is occasionally seen about the coasts, &c.

The *Cancer Bufo*, or Toad Crab, remarkable for its shape, and roughened surface, has been observed about the coasts of Wales.

The rare and singular fish, called *Gymnetrus Ascanii* (Gen. Zool.) remarkable for its great length, and thin, compressed, silver-coloured body, is sometimes seen on the English coasts. In the Northern seas it is said to be generally seen either preceding or accompanying shoals of Herrings, from which circumstance it has obtained the popular title of King of the Herrings.

Among the rarer British Insects is very happily numbered the *Gryllus migratorius*, or Migratory Locust, so destructive in some parts of Europe: with us it has rarely been seen in any considerable numbers, and then only as a straggler from other climes.

The curious and large species of Monoculus, called *Monoculus apus*, is sometimes found in muddy stagnant waters, but seems to be a local animal, and to be numbered among the rare British Insects. Its history has been given with elaborate exactness, by Schæffer a German naturalist. In that country it appears to be more common.

The *Papilio Antiopa*, usually ranked among the rarest of the British *Lepidoptera*, has, of late years made its appearance in greater number than formerly.

The

The beautiful *Hydrachna geographica*, remarkable for its polifhed jet-black colour variegated with gold-red fpots, is an inhabitant of the clearer kind of ftagnant waters. BRITAIN.

Among the Worm tribe the great *Sea-Gordius*, or Cornifh Long-worm, is one of the moft remarkable; meafuring from five to fifteen, (or as fome report) even thirty feet in length: its colour is olive-black, and its body flightly flattened: it has been chiefly feen about the coafts of Cornwall, and thofe of Scotland.

The curious Zoophyte, called *Lucernaria quadriloba*, has been found on the coafts of Ireland, attached to fuci, &c.

The three principal fpecies of thofe wonderful Zoophytes called *Hydræ*, or *Polypes*, are by no means uncommon in Britain, and are generally to be found, except during winter, in the clearer kind of ftagnant waters, and often in fuch as have a brifk current. Of thefe the moft common is the Green Polype, or *Hydra viridis*, of Linnæus. The *Hydra grifea* and *fufca*, or the Brown and Long-armed Polypes, are rather lefs common than the green. The particular hiftory of thefe Zoophytes can hardly be expected in a fketch like the prefent. Suffice it to fay, that their difcovery has formed as it were an epoch in the fcience of Natural Hiftory, and that they may be confidered as affording the cleareft and moft undoubted proofs of the union of animal and vegetable life. From the contemplation of thefe frefh-water Polypes, the ingenious Mr. Ellis was led to fuppofe, and at length to demonftrate, that many of the marine productions known by the general name of Corals and Corallines, and commonly regarded as fea-plants, were in reality Zoophytes, the animal part being analogous to the common Polype, but of a ramified or compound form, and guarded, in the different tribes, by a proper union either of horny or calcareous matter, in order to enable them to fupport their exiftence in the turbulent medium in which they are deftined to refide.

That curious Fifh called the *Gaftrobranchus cæcus*, erroneoufly ranked by Linnæus amongft the Vermes, under the name of Myxine *glutinofa*, is not unfrequently found about the Britifh coafts, and is faid to deftroy other fifhes by piercing their fkin, and fucking their juices, and even devouring all the internal parts. Its ufual length is from four to fix or feven inches, and its general appearance is that of a fmall eel: the mouth is fituated beneath, as in the Lamprey, and is of an oblong form, bearded

on

BRITAIN.

on each ſide, and furniſhed with a ſeries of teeth, diſpoſed on each ſide, into a double row, in form of a pectinated bone. This animal is deſtitute of eyes: the accurate examination of its ſtructure by Dr. Bloch, has proved it to belong to the tribe of cartilaginous fiſhes: the ſkin is ſmooth, and deſtitute of ſcales, and the animal is of an uncommonly glutinous nature.

FRANCE.

The *Beaver* is ſaid to be ſometimes found in the ſouthern parts of France, where however it does not appear to diſplay thoſe ſurpriſing talents in preparing its retreat, which are ſuppoſed to diſtinguiſh the American Beavers, and which have probably been much exaggerated by ſome of thoſe who have deſcribed their operations.

The very curious Inſect called the Lion-Piſmire, or *Myrmeleon Formicaleo*, which is not yet diſcovered in England, appears to be not uncommon in France, where it inhabits dry and ſandy places. In its complete or perfect ſtate this inſect bears no inconſiderable reſemblance to a ſmall Dragon-Fly, and purſues the ſmaller inſects in a ſimilar manner. It depoſits its eggs in ſandy ſituations, and the young, when hatched, begin ſeparately to exerciſe their extraordinary talent of preparing, by turning themſelves rapidly round, a very ſmall conical cavity in the ſand. Under the centre of this cavity the little animal conceals itſelf, ſuddenly ruſhing forth at intervals in order to ſeize any ſmall inſect which, by approaching too near the edge of the cavity, has been ſo unfortunate as to fall in; and, after ſucking out its juices, throws it to ſome diſtance beyond the cavity. As it increaſes in ſize it enlarges the cavity, which at length becomes about two inches or more in diameter. The larva, when full grown, is ſomewhat more than half an inch long, and of a flattened figure, broad towards the head, and gradually tapering to an obtuſe point at the extremity: its colour is a duſky brown, and the body is beſet with numerous ſmall tufts of duſky hair: the legs are ſlender, the head furniſhed with a pair of long, ſlightly curved and ſerrated jaws, and the whole animal is of a rather unpleaſing aſpect, bearing ſome general reſemblance, on a curſory view, to a Flat-bodied Spider. When arrived to its full growth, it envelopes itſelf in a round ball of ſand, which it

lines

lines and agglutinates with pearl-coloured ſilken fibres, drawn from the extremity of its body: it then changes into a chryſolis by caſting its ſkin; and, after the ſpace of about a month, gives birth to the perfect inſect. FRANCE.

Among the Inſects of France the beautiful *Phalæna Pavonia*, (*Ph. Junonia*, Gen. Zool.) deſerves particular mention, being by far the largeſt of all the European Lepidoptera. It proceeds from a very large green caterpillar which feeds on the leaves of apple and pear trees, &c. and is not very uncommon in the neighbourhood of Paris.

RUSSIA.

In ſome of the Southern parts of Ruſſia is ſaid to occur a very formidable inſect allied to the Spider tribe, and belonging to the genus *Solpuga*: its body is oblong, and the head furniſhed with a pair of very ſtrong fangs: the whole animal is of a brown colour, and hairy: its bite is conſidered as highly dangerous, and is even ſaid to prove ſometimes fatal.

AUSTRIA.

In the Zoology of this Empire, muſt by no means be omitted, the very ſingular and rare animal ſometimes called by the name of *Proteus anguinus*. It is a ſpecies of *Siren*; and, like the Siren *lacertina* of North America, has conſiderably embarraſſed ſyſtematic naturaliſts, ſome of whom have conſidered it as only the larva or imperfect ſtate of ſome hitherto undeſcribed ſpecies of Lizard, while others have regarded it as an animal in its perfect or ultimate ſtate. It is found in the remarkable Lake called *Zirchnitz* in Carniola, and particularly in the part called *Zitticher See*; and is about twelve or thirteen inches in length, of a pale fleſh-colour, and of a lengthened, cylindrical ſhape, not much unlike that of an eel: on each ſide the breaſt are three ramified branchial fins or breathing-organs, of a bright red colour: the fore legs have each three diviſions or toes; the hind legs only two: the tail is laterally compreſſed, and ſlightly rounded at the tip. This animal has no external eyes, thoſe organs, which are exceſſively ſmall, being ſeated beneath the

ſkin.

AUSTRIA.

ſkin. It is to be obſerved, that no ſpecies of Lizard of which this creature can poſſibly be ſuppoſed the larva, has ever been diſcovered in this part of Europe.

HOLLAND.

In many parts of this country is ſeen the White-winged *Ephemera*, ſo elaborately deſcribed by the famous Swammerdam, and which is generally conſidered as the moſt remarkable inſtance of the brevity of animal life; ſince, when arrived at its complete or ultimate ſtate, it ſurvives only a very few hours, periſhing in the courſe of the ſame evening that gave it birth. It is to be remembered, however, that its larva or caterpillar lives in its aquatic ſtate two, and ſometimes even three years, and is in this ſtate ſo tenacious of life that Swammerdam aſſures us that one which he pierced with a pin, and faſtened to a board, lived all the next day notwithſtanding. In its aquatic ſtate it is extremely allied to the larva of the common May-Fly, and when arrived at full growth, riſes, like that inſect, to the ſurface of the water, generally between the hours of ſix or ſeven in the evening; and, the ſkin of the back cracking, and ſpringing off with an elaſtic motion, the fly is almoſt inſtantaneouſly evolved, as in the common May-Flay, after which, it flies to the neareſt convenient ſpot, and, again diveſting itſelf of its pellicle, appears in its ultimate or perfect ſtate. It now flies again to the water, and fluttering over the ſurface, as if ſporting with its innumerable companions, enjoys all the pleaſures of its ſhort remiander of exiſtence: the female breeds, depoſits her eggs, and, like the male, periſhes, before or with the dawn of the ſucceeding day. It appears in this its perfect ſtate about Mid-ſummer, and the ſeaſon of its appearance laſts only three days, none being ſeen again till the following year. It ſeems to be the largeſt European ſpecies of Ephemera.

NORWAY.

One of the moſt remarkable animals in this country is a ſpecies of Rat called the Lemming. It is the *Mus Lemmus* of Linnæus, and is about the ſize of a very large Field-mouſe, and of a mixed or patched black and cheſnut-colour above, and white beneath. This animal is celebrated

for its wonderful migrations, which take place at diſtant and uncertain periods in different parts of the country. Its general reſidence is in the mountainous regions, from which it ſometimes deſcends into the plains below, in ſuch incredible numbers as to become a temporary ſcourge to the country, proceeding in a direct courſe, moving chiefly by night, and devouring all the herbage in the paſſage; the ſurface of the ground appearing as if burnt. Theſe deſtructive migrations ſeldom take place oftener than once in eight or ten years, and in ſome places not ſo often. Theſe animals were formerly believed to fall from the clouds at particular ſeaſons. NORWAY.

SWEDEN.

In ſome of the marſhy diſtricts of this country is ſaid to exiſt a moſt extraordinary animal, ranked by Linnæus among the Vermes, and called *Furia infernalis*. It is ſaid to bear ſome reſemblance to a minute *Scolopendra* or *Centipede*, having a thin, thread-ſhaped body, edged along each ſide with a row of ſharp, reverſed prickles, lying cloſe to the ſides of the body, or at very acute angles. In conſequence of this ſtructure it is capable of almoſt inſtantaneouſly perforating the ſkin, cauſing the moſt violent pain, and ſometimes proving fatal in the ſpace of a quarter of an hour. It is pretended that it drops from the air on the bodies of animals during the ſummer ſeaſon, and is not to be extracted without extreme difficulty and danger. Linnæus tells us that he himſelf once ſuffered from its attack, near the city of Lund in Sweden. Dr. Solander gave a ſlight deſcription of this animal, the exiſtence of which has however been ſometimes doubted. At all events the accounts of the evils produced by its attack ſeem to have been greatly exaggerated.

ITALY.

About the coaſts of Italy are ſeen many ſpecies of the curious genus called *Meduſa*, which are of a gelatinous ſubſtance, and float in numbers on the ſurface of the ſea. Among theſe the *Meduſa Pulmo* is one of the largeſt and moſt elegant. In its general appearance it repreſents a kind of

ITALY.

of chandelier, with a large, concave, umbrella-ſhaped top, ſcolloped round the edge, and having eight large, pendant branches, with ſixteen ſubtriangular appendages hanging from the principal or central trunk; the colour of the whole animal is a very pale, tranſparent blue.

APPENDIX

APPENDIX

TO

VOLUME FIRST.

No. I. *Treaties of Campo Formio* 1797, *and of Luneville* 1801.

*** *These Treaties having introduced considerable Alterations into European Geography, it was thought advisable to subjoin them.*

1. *Treaty of Campo Formio, with the Secret Articles,* 17th October 1797.

HIS majesty the emperor of the Romans, king of Hungary and Bohemia, and the French republic, being desirous to consolidate a peace, the basis of which was laid in the preliminaries signed at the castle of Eckenwald, near Leoben in Stiria, on the 18th of April 1797, (the 29th Germinal, 5th year of the French republic one and indivisible,) have named for their plenipotentiaries; viz his majesty the emperor and king, the Sieur D. Martius Mastrily, and the noble Neapolitan patrician Marquis de Gallo, knight of the royal order of St. Januarius, gentleman of the bedchamber to his majesty the king of the two Sicilies, and his ambassador extraordinary at the court of Vienna; the Sieur Louis, count of the holy Roman empire, de Cobenzel, and great cross of the royal order of St. Stephen, chamberlain, privy councillor of his said imperial and royal apostolic majesty, and his ambassador extraordinary to his imperial majesty of all the Russias; the Sieur Maximilian count de Meerveldt, knight of the Teutonic order, and of the military order of Maria Theresa, chamberlain and major-general of the cavalry in the armies of his said majesty the emperor and king; and the Sieur Ignatius baron de Degelmann, minister plenipotentiary of his said majesty to the Swiss republic:—and the French republic, Bonnaparte, commander in chief of the French army in Italy.

The aforesaid plenipotentiaries, after an exchange of their respective powers, have agreed upon the following articles:

Article I. There shall be hereafter a solid, perpetual, and inviolable peace, between his majesty the emperor of the Romans, king of Hungary and Bohemia, his heirs and successors, and the French republic.

The contracting parties shall give the greatest attention to the maintaining, between themselves and their respective dominions, the most perfect harmony, without hereafter permitting on either side any kind of hostilities to be committed, either by sea or land, for any cause or under any pretence whatever; and they shall carefully avoid for the future any thing which might prejudice the union happily established. There shall not be granted any succour or protection, either directly or indirectly, to those who shall attempt any thing injurious or prejudicial against either of the contracting parties.

II. Immediately after the exchange of the ratifications of the present treaty, the contracting parties shall take off all sequestrations imposed on the effects, rights, and properties of individuals residing in the respective territories and countries that are united to them, and also of the public establishments situated therein; they bind themselves to pay all the debts they may have contracted, for pecuniary advances made to them by the said individuals, and public establishments, and to discharge or reimburse all the

annuities settled to their advantage by each of the contracting parties. The present article is declared to extend to the Cisalpine republic.

III His majesty the emperor, king of Hungary and Bohemia, renounces for himself and his successors, in favour of the French republic, all his rights and titles to the ci-devant *Austrian Netherlands.* — The French republic shall enter on the perpetual possession of these countries, in full right and sovereignty, and on all the territorial possessions dependent thereon.

IV. All debts mortgaged before the war, on the land of the countries expressed in the preceding articles, and which mortgages shall have been drawn up with the usual formalities, shall be discharged by the French republic. The plenipotentiaries of his majesty the emperor, king of Hungary and Bohemia, shall transmit a statement of them, as soon as possible, to the plenipotentiary of the French republic, and previous to the exchange of the ratifications, to the end that, at the time of this exchange, the plenipotentiaries of both powers may come to an agreement upon all the explanatory and additional articles of the present treaty, and sign them.

V. His majesty the emperor, king of Hungary and Bohemia, consents that the French republic shall possess, in full sovereignty, the ci-devant *Venetian islands* of the Levant, viz. Corfou, Zante, Cephalonia, St. Maure, Cerigo, and other islands dependent thereon; together with Butrinto, Larta, Vouizza, and in general all the ci-devant Venetian establishments in Albania, which are situate lower down than the gulf of Lodrino.

VI. The French republic consents that his majesty the emperor and king shall possess, in full sovereignty, the countries hereinafter mentioned, viz. *Istria*, *Dalmatia*, the ci-devant Venetian islands in the Adriatic, the mouths of the Castaro, the city of *Venice*, the Venetian canals; and the countries that lie between the hereditary states of his majesty the emperor and king, the Adriatic sea, and the line to be drawn from the Tyrol along the torrent before Gardola, stretching across the lake Garda as far as Lacisa; from thence a military line shall be drawn to Sangiacomo, holding out an equal advantage to both parties, which line shall be traced out by engineer officers appointed on either side, previous to the exchange of the ratifications of the present treaty. The line or limitation shall then pass the Adige to Sangiacomo, running along the left bank of that river to the mouth of the Canalblanc, comprising in it that part of Porto Legnago that lies on the right side of the Adige, together with a district of 3000 toises. The line shall be continued along the left bank of the Canalblanc, the left bank of the Tartaro, the left bank of the canal called Polisella, to where it empties itself into the Po, and along the left bank of the Great Po as far as the sea.

VII. His majesty the emperor, king of Hungary and Bohemia, renounces for ever, in his own name, and in that of his successors, &c. in favour of the *Cisalpine republic*, all the rights, and titles arising from these rights, which his said majesty might pretend to have over these countries before the war, and which countries at present constitute a part of the Cisalpine republic; which republic shall possess them in their full right and sovereignty, together with all their territorial dependencies.

VIII. His majesty the emperor, king of Hungary and Bohemia, acknowledges the *Cisalpine republic* as an independent power. *This republic comprises* the ci-devant Austrian Lombardy, the Bergamesque, the Brescian, the Cremonesque, part of the ci-devant Venetian states to the east and south of the Legner, described in the sixth article as the frontier of the states of his majesty the emperor in Italy, the Modenese, the principality of Massa and Carrara, and the three legations of Bologna, Ferrara, and Romagna.

IX. In all countries ceded, acquired, or exchanged, in virtue of the present treaty, all sequestration imposed on the effects, rights, and property of individuals, belonging to these countries, shall be taken off; which individuals shall have been thus affected on account of the war that has subsisted between his imperial and royal majesty and the French republic; nor shall they on this account be molested in their persons and property. Such persons as may hereafter be desirous to withdraw from the said countries shall be bound to make a declaration of such their intention, three months before the publication of the treaty or definitive peace: There shall be granted them the term of three months to enable them to sell their effects, either moveable or immoveable, and dispose of them in the manner they may judge most expedient.

X. The countries ceded, acquired, or exchanged, by virtue of the present treaty, shall leave the debts mortgaged on their territories, to be discharged by those under whose dominion they may fall.

XI. The navigation of such rivers and canals as mark the boundaries between the possessions of his majesty the emperor, king of Hungary and Bohemia, and those of the French republic, shall be free; without its being permitted to either of the powers to establish any toll or custom on them, or keep thereon any armed vessel, by which however is not precluded any precaution which may be thought necessary for the protection and safety of the fortress of Porto Legnago.

XII. All sales or alienations of property, all engagements entered into either by the cities or by the government, or by the civil administrative authorities of the ci-devant Venetian territories, for the maintenance of the German and French armies, up to the date of the signature of the present treaty, shall be confirmed and acknowledged as valid.

XIII. The territorial titles and archives of the different countries, ceded or exchanged by the present treaty, shall, within two months from the date of the exchange

exchange of the ratification, be put into the hands of the powers which shall have acquired the property of them. The plans and maps of the fortresses, towns, and countries, which the contracting parties acquire by the present treaty, shall be faithfully given up to them. The military papers and registers, taken in the present war from the etat major of the respective armies, shall be restored in the same manner.

XIV. The two contracting parties, equally animated with the desire of removing every ground that might interrupt the good understanding happily established between them, mutually bind themselves, in the most solemn manner, to contribute, to the utmost of their power, to the maintenance of internal tranquillity in their respective states.

XV. There shall immediately be concluded a treaty of commerce, founded upon an equitable basis, and such as shall secure to his majesty the emperor, king of Hungary, and the French republic, advantages equal to those which the most favoured nations enjoy in their respective states. Meanwhile all communications, and commercial relations, shall be restored to the situation in which they stood before the war.

XVI. No inhabitant of all the countries occupied by the Austrian and French armies shall be prosecuted or questioned, either in his person or property, on account of his political opinions, or his conduct, civil, military, or commercial, during the war that has taken place between the two powers.

XVII. His majesty the emperor, king of Hungary and Bohemia, shall not, agreeably to the principles of neutrality, admit into any of his ports, during the course of the present war, any vessels belonging to any of the belligerent powers.

XVIII. His majesty the emperor, king of Hungary and Bohemia, binds himself to cede to the *duke of Modena*, as an indemnification for the territory which that prince and his heirs possessed in Italy, the *Brisgaw*; which he shall possess upon the same conditions as those in virtue of which he possessed the Modenese.

XIX. The landed and personal property not alienated, belonging to their royal highnesses the archduke Charles, and the archduchess Christiana, which are situated in the countries ceded to the French republic, shall be restored, under the deduction of the expences of sale, within three years. The same shall be done relative to the landed and personal property of his royal highness the archduke Ferdinand, in the territory of the Cisalpine republic.

XX. There shall be held a congress, solely composed of the plenipotentiaries of the Germanic empire and the French republic, for a pacification between the two powers. This congress shall be opened a month after the signing of the present treaty, or as soon as possible.

XXI. All the prisoners of war made on either side, and the hostages given or carried away, during the present war, who have not yet been restored, shall be given back in forty days, dated from the day of the signing of the present treaty.

XXII. The warlike contributions, deliveries, furnishings, and devastations of every kind, which have taken place in the respective states of the contracting powers, shall cease from the day on which the ratifications of the present treaty shall be exchanged.

XXIII. His majesty the emperor, king of Hungary and Bohemia, and the French republic, shall mutually preserve to each other the same ceremonial, with regard to rank and other etiquettes, which was constantly observed before the war. His said majesty and the Cisalpine republic shall observe, with regard to each other, the same ceremonial of etiquette which was in use between his majesty and the republic of Venice.

XXIV. The present treaty shall be ratified by the emperor, king of Hungary and Bohemia, and by the French republic, within thirty days from this day, or sooner if possible; and the instruments of ratification in due form shall be exchanged at Rastadt.

Done and signed at Campo Formio, near Udine, the 17th October 1797, (26th Vendemiaire, sixth year of the French republic, one and indivisible.)

(Signed) BUONAPARTE.
The MARQUIS DE GALLO.
LOUIS COUNT COBENTZEL.
The COUNT DE MERRVELDT.
The BARON DE DEGELMANN.

The executive directory ratifies and signs the present treaty of peace with his majesty the emperor, king of Hungary and Bohemia, negotiated in the name of the French republic by citizen Buonaparte, general in chief of the army of Italy, invested with powers by the executive directory, and charged with instructions to that effect.

Done in the national palace of the executive directory, 5th Brumaire, Oct. 26, sixth year of the French republic, one and indivisible.

This treaty was ratified by the council of five hundred on the 31st October; and by the council of elders two days after.

Secret Articles, and additional Convention, of the Treaty of Campo Formio, of the 26th Vendemiaire, 6th Year, (Oct. 17, 1797.)

Article I. His majesty the emperor, king of Hungary and Bohemia, consents that the boundaries of the French republic shall extend to the undermentioned line, and engages to use his influence that the French republic shall, by the peace to be concluded with the German empire, retain the same line as its boundary; namely, the *left bank of the Rhine*, from the confines of Switzerland below Basle, to the branching off of the Nette above Andernach, including the head of the bridge at Manheim the town and fortress of Mentz, and

and both banks of the Nette, from where it falls into the Rhine, to its source near Bruch. From thence the line passes by Kenscherade and Borley to Kerpen, and thence to Luderfdorf, Blantenheim, Marmagen, Coll, and Gemund, with all the circles and territory of these places along both banks of the Olff, to where it falls into the Roer, and along both banks of the Roer, including Heimbach, Nideggen, Durin, and Juliers, with their circles and territory; as also the places on the banks to Linnig included. Hence the line extends by Hoffern, and Kylensdalen, Papelernod, Lutersforst, Rodenberg, Haverstoo, Anderscheid, Kaldekuchen, Vampach, Herrigen, and Grosberg, including the town of Venloo and its territory. And if, notwithstanding the mediation of his imperial majesty, the German empire shall refuse to consent to the abovementioned boundary line of the republic, his imperial majesty hereby formally engages to furnish to the empire no more than his contingent, which shall not be employed in any fortified place; or it shall be considered as a rupture of the peace and friendship which are restored between his majesty and the republic.

II. His imperial majesty will employ his good offices, in the negotiation of the peace of the empire, to obtain, 1. That the *navigation of the Rhine*, from Hunningen to the territory of Holland, shall be free, both to the French republic and the states of the empire, on the right bank: 2. That the possessors of territory near the mouth of the Moselle shall never, and on no pretence, attempt to interrupt the *free navigation* and passage of ships and other vessels, *from the Moselle* into the Rhine: 3. The French republic shall have the *free navigation of the Meuse;* and the tolls and other imposts, from Venloo to Holland, shall be abolished.

III. His imperial majesty *renounces*, for himself and his successors, the sovereignty and possession of *the county of Falkenstein* and its dependencies.

IV. The countries which his imperial majesty takes possession of, in consequence of the sixth article of the public definitive treaty this day signed, shall be considered as an indemnification for the territory given up by the seventh article of the public treaty, and the foregoing article. This renunciation shall only be in force when the troops of his imperial majesty shall have taken possession of the countries ceded by the said articles.

V. The French republic will employ its influence that his majesty the emperor shall receive the *archbishopric of Salzburg*, and that part of the circle of *Bavaria* which lies between the archbishopric of Salzburg, the river Inn, Salza, and Tyrol; including the town of Wasserburg on the right bank of the Inn, with an arrondissement of 3000 toises.

VI. His imperial majesty, at the conclusion of the peace with the empire, will give up to the French republic the sovereignty and possession of the *Frickthal*, and all the territory belonging to the house of Austria on the *left bank of the Rhine*, between Zurgach and Basle, provided his majesty, at the conclusion of the said peace, receives a proportionate indemnification. The French republic, in consequence of particular arrangements to be made, shall unite the abovementioned territory with the Helvetic republic, without further interference on the part of his imperial majesty or the empire.

VII. The two contracting powers agree that when, in the ensuing peace with the German empire, the French republic shall make an acquisition in Germany, his imperial majesty shall receive an equivalent; and if his imperial majesty shall make such an acquisition, the French republic shall in like manner receive an equivalent.

VIII. The prince of Nassau Dietz, late *stadtholder* of Holland, shall receive a territorial indemnification; but neither in the vicinity of the Austrian possessions, nor in the vicinity of the Batavian republic.

IX. The French republic makes no difficulty to restore the *king of Prussia* his possessions on the left bank of the Rhine. No new acquisition shall however be proposed for the king of Prussia. This the two contracting powers mutually guarantee.

X. Should the king of Prussia be willing to cede to the French and Batavian republics some small parts of his territory on the left bank of the Meuse, as Sevenger, and other possessions towards the Yssel, his imperial majesty will use his influence that such cessions shall be accepted and made valid by the empire.

XI. His imperial majesty will not object to the manner in which the *imperial fiefs* have been disposed of by the French republic in favour of the Ligurian republic. His imperial majesty will use his influence, together with the French republic, that the German empire will renounce all feudal sovereignty over the countries which make a part of the Cisalpine and Ligurian republics, as also the imperial fiefs, such as Lanigiana, and those which lie between Tuscany and the states of Parma, the Ligurian and Lucchese republics, and the late territory of Modena; which fiefs make a part of the Cisalpine republic.

XII. His imperial majesty, and the French republic, will in concert employ their influence, in the course of concluding the peace of the empire, that the princes and states of the empire who, in consequence of the stipulations of the present treaty of peace, or in consequence of the treaty to be concluded with the empire, shall suffer any loss in territory or rights, (particularly the electors of Mentz, Treves, and Cologne, the elector palatine of Bavaria, the duke of Wirtemberg and Teck, the margrave of Baden, the duke of Deux Ponts, the landgraves of Hesse Cassel and Darmstadt, the princes of Nassau Saarbruck, Salm, Korburg, Lowenstein, Weltheim, and Wied Runckel, and the count de Leyn,) shall receive proportionable indemnifications in Germany, which shall be settled by mutual agreement with the French republic.

XIII. The

XIII. The troops of his imperial majesty, twenty days after the ratifications of the present treaties, shall evacuate the towns and fortresses of Mentz, Ehrenbreitstein, Philipsburg, Manheim, Kunigstein, Ulm, and Ingolstadt; as also the whole territory appertaining to the German empire, to the boundaries of the hereditary states.

XIV. The present secret articles shall have the same force as if they were inserted word for word in the public treaty of peace this day signed; and shall, in like manner, be ratified at the same time by the two contracting powers; which ratifications shall be exchanged in due form at Rastadt.

Done and signed at Campo Formio, on the 17th Oct. 1797, 26th Vendemiaire, in the 6th year of the French republic, one and indivisible.

(Signed) BUONAPARTE.
MARQUIS DE GALLO.
LOUIS COUNT COBENTZEL.
COUNT MEERFELDT, Major-Gen.
COUNT DEGELMANN.

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2. *Treaty of Luneville*, 9th Feb. 1801.

HIS majesty the emperor, king of Hungary and Bohemia, and the first consul of the French republic, in the name of the French people, being equally desirous to put an end to the misfortunes of the war, have resolved to proceed to the conclusion of a definitive treaty of peace and friendship.

His said imperial and royal majesty, not being less ardently desirous to make the Germanic empire partake of the benefits of peace, and the present junctures not leaving [illegible] necessary for the empire being consulted, and being able to intervene deputies in the negotiation; and his said majesty considering besides what has been consented to by the deputation of the empire, in the preceding congress of Rastadt, has resolved, (as it has been done in similar circumstances,) to stipulate in the name of the Germanic body.

In consequence of which the contracting parties have appointed for their plenipotentiaries—his imperial and royal majesty, the Sieur Louis count of the holy Roman empire, de Cobentzel, knight of the golden fleece, grand cross of the royal order of St. Stephen, and of the order of St. John of Jerusalem, chamberlain, actual privy counsellor of his said imperial and royal majesty, his minister of conferences, and the vice-chancellor of court and state; and the first consul of the French republic, in the name of the French people, citizen Joseph Buonaparte counsellor of State:

Who, after having exchanged their full powers, have determined on the following articles:

Article I. There shall be for the future, and for ever, peace, friendship, and good intelligence, between his majesty the emperor, king of Hungary and Bohemia, stipulating as well in his name as in the name of the Germanic empire, and the French republic; his said majesty pleading himself to make the said empire ratify, in good and due form, the present treaty. The g[illegible]ate attention will be given on one part, and on the ot[illegible]r, to the maintenance of a perfect harmony, and to prevent any kind of hostility, by land or by sea, for whatever cause, and under whatever pretence, by applying themselves with care to entertain the union happy re-established. No assistance and protection will be given, neither directly nor indirectly, to those who would prejudice one or the other of the contracting parties.

II. The *cession of the* ci devant *Belgic provinces* to the French republic, stipulated by the third article of the treaty of Campo Formio, is here renewed in the most formal manner; so that his imperial and royal majesty, for himself and his successors, as well in his name as in the name of the Germanic empire, renounces all his rights and titles to the aforesaid provinces, which shall be possessed for ever, in full sovereignty and property, by the French republic, with all the territorial estates belonging to them.

There shall likewise be given up to the French republic, by his imperial and royal majesty, and with the formal consent of the empire—

1st. The *county of Falkenstein*, with all its dependencies:

2dly. The *Frickthal*, and every thing which belongs to the house of Austria, on the *left bank of the Rhine*, between Zurzach and Basle; the French Republic reserving to herself to yield this last country to the Helvetic republic.

III. In the same manner, in renewing and confirming the 6th article of the treaty of Campo Formio, his majesty the emperor and king shall possess in full sovereignty and property the countries hereafter designed, to wit:—*Istria*, *Dalmatia*, and the Venetian states of the Adriatic dependent thereon; the mouths of the Catara, the city of *Venice*, the marshes (les lagunes,) and the country comprized between the hereditary states of the emperor, the Adriatic sea, and the Adige, from its quitting Tyrol to its embouchure in the said sea, the *thalweg* of the Adige serving for a line of limitation: and as the adopting of this line will intersect the towns of Verona and Porto Legnago, drawbridges shall be established in the middle of them, in order to mark their separation.

IV. The eighteenth article of the treaty of Campo Formio is in like manner renewed, so far as obliges his majesty the emperor and king to cede to the *duke of Modena*, as an indemnity for the country this prince and his heirs had in Italy, the *Brisgau*, which he shall possess on the same conditions as those in virtue of which he possessed the Modenese.

V. It is also agreed, that his royal highness the grand duke of Tuscany renounces for himself, his successors and assigns, the *grand duchy of Tuscany*, and that

that part of the island of *Elba* which is dependant thereon, as well as all rights and titles resulting from the dominion of the said states; the same shall be possessed in full sovereignty and property by his royal highness *the infant duke of Parma*. The grand duke will obtain a full indemnity in Germany for the loss of his estates in Italy. The grand duke may dispose as he pleases of the estates and property which he particularly possesses in Tuscany, whether by personal acquisition, or by heirship of the personal acquisitions of the deceased emperor Leopold II., his father, or of the deceased emperor Francis I., his grandfather. It is also agreed, that the trusts, establishments, and other property of the grand duchy, as well as the debts from mortages on the country, shall be transferred to the new grand duke.

VI. His majesty the emperor and king, as well in his own name as in that of the Germanic empire, consents that in future the French republic shall possess, in full sovereignty and property, the countries and domains situated on the *left bank of the Rhine*, and which made part of the German empire, in a manner conformable to that which had been expresly consented to at the congress of Rastadt by the deputation of the empire, and approved by the emperor; the *thalweg* of the Rhine being hereafter the limit between the French republic and the German empire, to wit, from the place where the Rhine leaves the Helvetic territory, to that where it enters the Batavian territory. In consequence of which the French republic formally renounces every possession whatsoever on the right bank of the Rhine, and consents to restore to whomsoever they may belong the places of Dusseldorff, Ehrenbreitstein, Philipsburg, the fort of Cassel, and other fortifications opposite Mayence on the right bank; as also the fort of Kehl and Old Brissac, upon the express conditions that those places and forts shall continue and remain in the same state as at their evacuation.

VII. And as in virtue of the cession which the empire makes to the French republic, several princes and states of the empire will be dispossessed, in the whole or in part, of what belonged to them, particularly; while collectively the German empire has to support the losses resulting from the stipulations of the present treaty; it is agreed between his majesty the emperor and king, as well in his own name as in that of the German empire, and the French republic, that, comformably to the principles laid down and established at the congress of Rastadt, the empire is bound to give to the hereditary princes, so dispossessed on the left bank of the Rhine, an indemnification to be taken from the body of the empire, according to the arrangements which, after the said basis, will be ultimately determined upon.

VIII. Throughout all the ceded countries, acquired or exchanged by the present treaty, it is agreed upon, as it had been by the 4th and 10th articles of the treaty of Campo Formio, that those to whom they will belong take upon themselves the debts as mortgages upon the land of the said country; but in consideration of the difficulties which, in regard to this matter, the interpretation of the said articles in the treaty of Campo Formio gave rise to, it is expresly understood that the French republic only takes upon itself the debts arising from the loans formerly consented to by the states of the ceded countries, or the expences incurred by the effective administration of the said countries.

IX. Immediately after the exchange of the ratification of the present treaty, there shall be granted, in all the countries ceded, acquired, or exchanged by the said treaty, to all the inhabitants and proprietors whomsoever, an exemption from the sequestration put on their goods, effects, and revenues, on account of the war which has taken place. The contracting parties oblige themselves to discharge all they may owe for principal lent to them, by the said individuals, as well as by the public establishments of the said countries; and to pay or reimburse all the interest accruing to them by each of the said parties. In consequence, of which it is expresly stipulated that the proprietors of stock of the bank of Vienna, become French, shall continue to enjoy the benefit of their stock, and receive the interest accrued or to accrue, notwithstanding any sequestration or forfeiture, which shall be considered as not having taken place; particularly the forfeiture resulting from the French proprietors not having furnished the thirty, and the cent per cent, demanded of the proprietors of stock of the bank of Vienna by his majesty the emperor and king.

X. The contracting parties shall reciprocally remove the sequestrations that have been put, in consequence of the war, on the goods, rights, and revenues of the subjects of his majesty the emperor, or of the empire, in the territory of the French republic; and of the French citizens, in the states of his said majesty or of the empire.

XI. The present treaty of peace, particularly the articles 8, 9, 10, and the 15th hereinafter, are declared common to the Batavian, Helvetic, Cisalpine, and Ligurian republics. The contracting parties mutually guarantee the independence of the said republics; and the right of the people who inhabit them to adopt such form of government as they shall judge fit.

XII. His imperial and royal majesty renounces for himself and his successors, in favour of the Cisalpine republic, all rights and titles accruing from those rights, which he might claim over those countries which he possessed before the war; and which, under the terms of the 8th article of the treaty of Campo Formio, make a part of the *Cisalpine republic*, which shall possess them in full sovereignty and property, with all the territorial property depending on them.

XIII. His imperial and royal majesty, as well in his own name as in the name of the Germanic empire, confirms the adherence already given, by the treaty of Campo Formio, to the re-union of the heretofore *imperial*

perial fiefs to the Ligurian republic; and renounces all rights and titles accruing from those rights over the said fiefs.

XIV. Conformably to the article of the treaty of Campo Formio the navigation of the Adige, serving as the limit between the states of his imperial and royal majesty, and those of the Cisalpine republic, shall be free; so that neither party shall establish thereon any toll, nor keep any armed vessels thereon.

XV. All the prisoners of war, taken on the one side and the other, as well as the hostages taken or given during the war, who have not yet been restored, shall be restored within forty days from the signature of the present treaty.

XVI. All the real and personal property of his royal highness the archduke Charles, not alienated, and of the heirs of her late royal highness the archduchess Christiana, situated in the countries ceded to the French republic, shall be restored to them on condition that the said property shall be sold within the space of three years. The same shall extend to the real and personal property of their royal highnesses the archduke Ferdinand, and the archduchess Beatrix his wife, which they possessed in the territory of the Cisalpine republic.

XVII. The 12th, 13th, 15th, 16th, 17th, and 18th articles of the treaty of Campo Formio shall be again in full force, to be executed according to their form and tenor, as if they were inserted verbatim in the present treaty.

XVIII. The contributions, levies, supplies of provisions and other supplies of war, shall cease from the date of the exchange of the ratifications of the present treaty, on the part of his majesty the emperor, and by the Germanic empire, and on the part of the French republic.

XIX. The present treaty shall be ratified by his majesty the emperor and king, by the empire, and by the French republic, within thirty days, or sooner if it can be done; and it is agreed upon that the armies of the two powers shall remain in the positions where they now are, both in Germany and Italy, until the said ratifications of the emperor and king, of the empire, and of the French republic, shall be at the same time exchanged at Luneville by the respective plenipotentiaries. It is also agreed upon, that ten days after the exchange of the said ratifications, the armies of his imperial and royal majesty shall re-enter his hereditary possessions, which shall in the same time be evacuated by the French armies; and that thirty days after the said exchange the French armies shall evacuate the whole of the territory of the said empire.

Done and signed at Luneville, the 20th Pluvoise, 9th year of the French republic—9th Feb. 1801.

LOUIS COUNT COBENTZEL.
JOSEPH BUONAPARTE.

No. II. *Treaty of Peace between Great Britain and the French Republic, concluded at Amiens, 27th March 1802*.*

Article I. THERE shall be peace, friendship, and good understanding between the French republic, his majesty the king of Spain, his heirs and successors, and the Batavian republic, on the one side, and his majesty the king of the united kingdom of Great Britain and Ireland, his heirs and successors, on the other part. The contracting parties shall use their utmost efforts to preserve a perfect harmony between their respective countries, without permitting any act of hostility whatever, by sea or by land, for any cause, or under any pretext. They shall carefully avoid every thing which might for the future disturb the happy union now re-established between them; and shall not give any succour or protection, directly or indirectly, to those who would wish to injure any one of them.

II. All the prisoners made on one side and the other, as well by land as by sea, and the hostages carried off or delivered up during the war, and to the present day, shall be restored without ransom, in six weeks at the latest, to be reckoned from the day on which the ratifications of the present treaty are exchanged; and on paying the debts which they shall have contracted during their captivity. Each of the contracting parties shall respectively discharge the advances which shall have been made by any of the contracting parties, for the support and maintenance of prisoners, in the countries where they have been detained. There shall be appointed, by mutual consent, for this purpose, a commission specially empowered to ascertain and determine the compensation which may be due to any one of the contracting parties. The time and the place shall likewise be fixed by mutual consent, for the meeting of the commissioners, who shall be entrusted with the execution of this article; and who shall take into account not only the expences incurred on account of the prisoners of the respective nations, but likewise on account of the foreign troops who, before being taken, were in the pay, and at the disposal, of one of the contracting parties.

III. His Britannic majesty restores to the French republic

* Translated from the French counterpart.

republic and its allies, viz. his catholic majesty and the Batavian republic, all the possessions and colonies which respectively belonged to them, and which have been either occupied or conquered by the British forces during the course of the present war, with the exception of the island of Trinidad, and of the Dutch possessions in the island of Ceylon.

IV. His catholic majesty cedes and guarantees, in full property and sovereignty, the island of Trinidad, to his Britannic majesty.

V. The Batavian republic cedes and guarantees, in full property and sovereignty, to his Britannic majesty all the possessions and establishments in the island of Ceylon, which previous to the war belonged to the republic of the United Provinces, or to the Dutch East India Company.

VI. The port of the Cape of Good Hope remains to the Batavian republic, in full sovereignty, in the same manner as it did previous to the war.—The ships of every kind belonging to the other contracting parties shall be allowed to enter the said port, and there to purchase what provisions they may stand in need of, as heretofore, without being liable to pay any other impost than such as the Batavian republic compels the ships of its own nation to pay.

VII. The territories and possessions of her most faithful majesty are maintained in their integrity, such as they were antecedent to the war. Nevertheless, the boundaries of French and Portuguese Guiana are fixed by the river Arawari, which empties itself into the Ocean above Cape North, near the islands Nuovo and Penetentia, about a degree and a third of north latitude. These boundaries shall run along the river Arawari, from its mouth the most distant from Cape North, to its source, and afterwards on a right line, drawn from that source to the Rio-Branco towards the west. In consequence the northern bank of the river Arawari, from its most distant mouth to its source, and the territories that lie to the north of the line of the boundaries, laid down as above, shall belong in full sovereignty to the French republic. The southern bank of the said river, from the same mouth, and all the territories to the south of the said line, shall belong to her most faithful majesty.—The navigation of the river Arawari, along the whole of its course, shall be common to both nations.—The arrangements which have been agreed upon between the courts of Madrid and Lisbon, respecting the settlement of their boundaries in Europe, shall nevertheless be adhered to, conformably to the stipulations of the treaty of Badajoz.*

VIII. The territories, possessions, and rights of the Sublime Porte are maintained in their integrity, as they were before the war.

IX. The republic of the Seven Islands is recognised.

X. The islands of Malta, Gozo, and Comino, shall be restored to the order of St. John of Jerusalem, to be held on the same conditions on which it possessed them before the war, and under the following stipulations:

1. The knights of the order, whose languages shall continue to subsist after the exchange of the ratification of the present treaty, are invited to return to Malta as soon as the exchange shall have taken place. They will there form a general chapter, and proceed to the election of a grand master, chosen from among the natives of the nation which preserve their language,† unless that election has been already made since the exchange of the preliminaries.—It is understood that an election made subsequent to that epoch shall alone be considered valid, to the exclusion of any other that may have taken place at any period prior to that epoch.

2. The governments of the French republic and of Great Britain, desiring to place the order and island of Malta in a state of entire independence, with respect to them, agree that there shall not be in future either a French or English language, and that no individual belonging to either the one or the other of these powers shall be admitted into the order.

3. There shall be established a Maltese language which shall be supported by the territorial revenues and commercial duties of the island. This language shall have its peculiar dignities, an establishment, and an hotel. Proofs of nobility shall not be necessary for the admission of knights of this language; and they shall be moreover admissible to all offices, and shall enjoy all privileges, in the same manner as the knights of the other languages. At least half of the municipal administrative, civil, judicial, and other employments depending on the government, shall be filled by inhabitants of the islands of Malta, Gozo, and Comino.

4. The forces of his Britannic majesty shall evacuate the island and its dependencies within three months from the exchange of the ratifications, or sooner if possible. At that epoch it shall be given up to the order, in its present state, provided the grand master or commissaries, fully authorised according to the

* By that treaty the small province of Olivenza was ceded to Spain, and the river Guadiana constituted the boundary between Spain and Portugal. By the treaty between France and Portugal, 29th September 1801, it was affirmed "that the boundaries of French and Portuguese Guiana shall be determined in future by the river Carapanatuba, which flows into the river Amazon, about a third of a degree of north latitude above fort Macapa. These limits shall follow the course of the river to its source, whence they shall take a direction to the grand chain of mountains which divide the two rivers; they shall follow the windings of that chain to the point nearest to Rio Branco, between the second and third degree north of the equator."

† A language here signifies a right of election, as belonging to a particular catholic nation. Thus, in the Maltese form, the knights chosen in France were styled of the French language, &c.

the ſtatutes of the order, ſhall be in the iſland to take poſſeſſion; and that the force which is to be provided by his Sicilian majeſty, as is hereafter ſtipulated, ſhall have arrived there.

5. One half of the garriſon at leaſt ſhall be always compoſed of native Maltese; for the remainder the order may levy recruits in thoſe countries only which continue to poſſeſs the languages (*poſſeder les langues*). The Maltese troops ſhall have Maltese officers. The command in chief of the garriſon, as well as the nomination of the officers, ſhall pertain to the grand maſter; and this right he cannot reſign, even temporarily, except in favour of a knight, and in concurrence with the advice of the council of the order.

6. The independence of the iſles of Malta, of Gozo, and Comino, as well as the preſent arrangement, ſhall be placed under the protection and guarantee of France, Great Britain, Auſtria, Spain, Ruſſia, and Pruſſia.

7. The neutrality of the order, and of the iſland of Malta, with its dependencies, is proclaimed.

8. The ports of Malta ſhall be opened to the commerce and navigation of all nations, who ſhall there pay equal and moderate duties: theſe duties ſhall be applied to the cultivation of the Maltese language, as ſpecified in paragraph 3; to that of the civil and military eſtabliſhments of the iſland; as well as to that of a general *lazaretto*, open to all enſigns.

9. The ſtates of Barbary are excepted from the conditions of the preceding paragraphs, until, by means of an arrangement to be procured by the contracting parties, the ſyſtem of hoſtilities, which ſubſiſts between the ſtates of Barbary and the order of St. John, or the powers poſſeſſing the languages, or concurring in the compoſition of the order, ſhall have ceaſed.

10. The order ſhall be governed, both with reſpect to ſpirituals and temporals, by the ſame ſtatutes which were in force when the knights left the iſle, as far as the preſent treaty ſhall not derogate from them.

11. The regulations contained in the paragraphs 3, 5, 7, 8, and 10, ſhall be converted into laws and perpetual ſtatutes of the order, in the cuſtomary manner: and the grand maſter, (or if he ſhall not be in the iſland at the time of its reſtoration to the order, his repreſentative,) as well as his ſucceſſors, ſhall be bound to take an oath for their punctual obſervance.

12. His Sicilian majeſty ſhall be invited to furniſh two thouſand men, natives of his ſtates, to ſerve in garriſon of the different fortreſſes of the ſaid iſlands. That force ſhall remain one year, to bear date from their reſtitution to the knights; and if at the expiration of this term, the order ſhould not have raiſed a force ſufficient, in the judgment of the guaranteeing powers, to garriſon the iſland and its dependencies, ſuch as is ſpecified in the paragraph, the Neapolitan troops ſhall continue there until they ſhall be replaced by a force deemed ſufficient by the ſaid powers.

13. The different powers deſignated in the 6th paragraph, viz. France, Great Britain, Auſtria, Spain, Ruſſia, and Pruſſia, ſhall be invited to accede to the preſent ſtipulations.

XI. The French troops ſhall evacuate the kingdom of Naples and the Roman ſtates; the Engliſh forces ſhall alſo evacuate Porto Ferrajo, and generally all the ports and iſlands which they occupy in the Mediterranean, or the Adriatic.

XII. The evacuations, ceſſions, and reſtitutions, ſtipulated by the preſent treaty, ſhall be executed in Europe within a month; on the continent and ſeas of America and Africa, in three months; on the continent and ſeas of Aſia, in the ſix months which ſhall follow the ratification of the preſent definitive treaty; except in caſe of a ſpecial reſervation.

XIII. In all caſes of reſtitution agreed upon by the preſent treaty, the fortifications ſhall be reſtored in the condition they were in at the time of ſigning the preliminaries; and all the works which ſhall have been conſtructed ſince their occupation, ſhall remain untouched. It is agreed beſides, that in all the ſtipulated caſes of ceſſions, there ſhall be allowed to the inhabitants, of whatever rank or nation they may be, a term of three years, reckoning from the ratification of the preſent treaty, to diſpoſe of all their properties, whether acquired or poſſeſſed by them, before or during the continuance of the preſent war; during which term of three years they ſhall have free and entire liberty to exerciſe their religion, and to enjoy their fortunes. The ſame power is granted in the countries that are hereby reſtored, to all perſons, whether inhabitants or not, who ſhall have formed any eſtabliſhments there during the time that thoſe countries were in the poſſeſſion of Great Britain.—As to the inhabitants of the countries reſtored or ceded, it is hereby agreed that no perſon ſhall, under any pretence, be proſecuted, diſturbed, or moleſted, either in perſon or property on account of his political conduct or opinion, or for his attachment to any of the contracting parties, or any account whatever, except debts contracted with individuals, or for acts ſubſequent to the preſent treaty.

XIV. All the ſequeſtrations laid on either ſide, upon funds, revenues, and credits, of what nature ſoever they may be, belonging to any of the contracting powers, or to their citizens or ſubjects, ſhall be taken off immediately after the ſignature of this definitive treaty. The deciſion of all claims among the individuals of the reſpective nations, for debts, property, effects, or rights of any nature whatſoever, which ſhould, according to received uſages and the law of nations, be produced at the epoch of the peace, ſhall be referred to the competent tribunals; in all thoſe caſes ſpeedy and complete juſtice ſhall be done in the countries wherein thoſe claims ſhall be reſpectively preferred.

XV. The fiſheries on the coaſts of Newfoundland and of the adjacent iſlands, and in the gulf of St. Lawrence, are replaced on the ſame footing as they

were before the war. The French fishermen of Newfoundland, and the inhabitants of the islands of St. Pierre and Miquelon, shall have liberty to cut such wood as may be necessary for them in the bays of Fortune and Despair, during one year, reckoning from the ratification of the present treaty.

XVI. To prevent all grounds of complaint and disputes which might arise on account of captures which may have been made at sea subsequent to the signing of the preliminaries, it is reciprocally agreed that the ships and property which may have been taken in the Channel and in the North Seas, after a space of twelve days, reckoning from the exchange of the ratifications of the preliminary articles, shall be restored on one side and the other; that the term shall be one month for the space from the Channel and the North Seas as far as the Canary Islands inclusively, as well in the Ocean as in the Mediterranean; two months from the Canary Islands to the Equator; and finally, five months in all the other parts of the world, without any further exception or distinction of time or place.

XVII. The ambassadors, ministers, and other agents of the contracting powers, shall enjoy respectively in the states of the said powers, the same rank, privileges, prerogatives, and immunities, which were enjoyed before the war by agents of the same class.

XVIII. The branch of the house of Nassau, which was established in the ci-devant republic of the United Provinces, now the Batavian republic, having experienced some losses, as well with respect to private property as by the change of constitution adopted in those countries, an equivalent compensation shall be procured for the losses which it shall be proved to have sustained.

XIX. The present definitive treaty of peace is declared common to the Sublime Ottoman Porte, the ally of his Britannic majesty; and the Sublime Porte shall be invited to transmit its act of accession as soon as possible.

XX. It is agreed that the contracting parties, upon requisitions made by them respectively, or by their ministers or officers duly authorised for that purpose, shall be bound to deliver up to justice persons accused of murder, forgery, or fraudulent bankruptcy, committed within the jurisdiction of the requiring party, provided that this shall only be done in cases in which the evidence of the crime shall be such, that the laws of the place, in which the accused person shall be discovered, would have authorised the detaining and bringing him to trial had the offence been committed there. The expences of the arrest and the prosecution shall be defrayed by the party making the requisition; but it is understood that this article has no sort of reference to crimes of murder, forgery, or fraudulent bankruptcy committed before the conclusion of this definitive treaty.

XXI. The contracting parties promise to observe, sincerely and faithfully, all the articles contained in the present treaty; and will not suffer any sort of counteraction, direct or indirect, to be made to it by their citizens, or respective subjects. And the contracting parties guarantee, generally and reciprocally, all the stipulations of the present treaty.

XXII. The present treaty shall be ratified by the contracting parties within the space of thirty days, or sooner if possible; and the ratifications shall be exchanged in due form at Paris.

In testimony whereof we, the undersigned plenipotentiaries, have signed with our hands, and in virtue of our respective full powers, the present definitive treaty, causing it to be sealed with our respective seals.

Done at Amiens, the 6th Germinal, in the year 10. (March 27, 1802.)

(Signed) J. Bonaparte.
Cornwallis.
Azara.
Schimmelpenninck.

No. III. *Treaty of Presburg*, 26 *Dec.* 1805.

His Majesty the emperor of Germany and of Austria, and his majesty the emperor of the French, king of Italy, equally animated with a desire to put an end to the calamities of war, have resolved to proceed without delay to the conclusion of a definitive treaty of peace, and have in consequence named as plenipotentiaries, to wit:—

His majesty the emperor of Germany and of Austria, the prince John of Lichtenstein, prince of the Holy Roman Empire, Grand Cross of the military order of Maria Teresa, chamberlain, lieutenant general of the armies of his said majesty the emperor of Germany and of Austria, and proprietor of a regiment of hussars; and count Ignaz de Gnylai, commander of the military order of Maria Teresa, chamberlain of his said majesty the emperor of Germany and Austria, lieutenant general of his armies, and proprietor of a regiment of infantry; and his majesty the emperor of France, king of Italy, Charles Maurice Talleyrand Perigord, grand chamberlain, minister of the foreign relations of his said majesty the emperor of France and king of Italy, grand cordon of the Legion of Honour, and knight of the red and black eagle of Prussia; who having exchanged their full powers, have agreed as follows:—

Article I.

Article I. There shall be from the date of this day, peace and friendship between his majesty the emperor of Germany and Austria, and his majesty the emperor of the French, king of Italy, their heirs and successors, their states and subjects respectively for ever.

II. France shall continue to possess in property and sovereignty the duchies, principalities, lordships, and territories beyond the Alps, which were before the present treaty united and incorporated with the French empire, or governed by the laws and government of France.

III. His majesty the emperor of Germany and Austria for himself, his heirs, and successors, recognizes the dispositions made by his majesty the emperor of France, king of Italy, relative to the principalities of Lucca and Piombino.

IV. His majesty the emperor of Germany and Austria renounces, as well for himself as for his heirs and successors, that part of the states of the republic of Venice, ceded to him by the treaties of Campio Formio and Luneville, which shall be united in perpetuity to the king of Italy.

V. His majesty the emperor of Germany and of Austria, acknowledges his majesty the emperor of the French as king of Italy; but it is agreed that, in conformity with the declaration made by his majesty the emperor of the French, at the moment when he took the crown of Italy, that as soon as the parties named in that declaration shall have fulfilled the conditions therein expressed, the crowns of France and Italy shall be separated for ever, and cannot in any case be united on the same head. His majesty the emperor of Germany binds himself to acknowledge, on the separation, the successor, his majesty the emperor of the French, shall appoint to himself as king of Italy.

VI. The present treaty of peace is declared to comprehend their most serene highnesses the electors of Bavaria, Wirtemberg, and Baden, and the Batavian republic, allies of his majesty, the emperor of the French, in the present war.

VII. The electors of Bavaria and Wirtemberg having taken the title of king, without ceasing nevertheless to belong to the Germanic confederation, his majesty the emperor of Germany and Austria acknowledges them in that character.

VIII. His majesty the emperor of Germany and Austria, as well for himself, his heirs and successors, as for the princes of his house, their heirs and successors respectively, renounces the principalities, lordships, domains, and territories, hereinafter specified:

Cedes and abandons to his majesty the king of Bavaria the margraviate of Burgau and its dependencies, the principality of Eichstadt, the part of the territory of Passau belonging to the elector of Salzburg, and situated between Bohemia, Austria, the Danube, and the Inn; the country of Tyrol, comprehending therein the principalities of Brixen and Botzen, the seven lordships of the Voralberg, with their detached dependencies; the county of Hokeneme, the county of Konigsegg, Rottenfels, the lordships of Tetnany and Argen, and the town and territory of Lindau.

To his majesty the king of Wirtemberg, the five cities of the Danube, to wit——Ehingen, Munderkengen, Rufflingen, Mengen, and Salgaw, with their dependencies, the city of Constance excepted, that part of the Brisgaw which extends in the possession of Wirtemberg, and situated to the east of a line drawn from Schlegelburg to Molbach, and the towns and territories of Willengen and Brentingen.

To his most serene highness the elector of Baden, the Brisgaw (with the exception of the branch and separate portions above described), the Ortenfaw and their dependencies, the cities of Constance, and the commandery of Meinau.

The principalities, lordships, domains, and territories above mentioned, shall be possessed respectively by their majesties the kings of Bavaria and Wirtemberg, and by his most serene highness the elector of Baden, as well in paramount as in full property and sovereignty, in the same manner, by the same titles, and with the same rights and prerogatives, with which they were possessed by his majesty the emperor of Germany and Austria, or the princes of his house, and not otherwise.

IX. His majesty the emperor of Germany and Austria acknowledges the debts contracted by the house of Austria, for the benefit of private persons and public establishments of the country, making at present an integrant part of the French empire; and it is agreed that his said majesty shall remain free from all obligation, with respect to any debts whatsoever which the house of Austria may have contracted, on the ground of the possession, and of securities on the soil of the countries which it renounces by the present treaty.

X. The county of Salzburg, and of Berchtolsgaden, belonging to his royal and electoral highness prince Ferdinand, shall be incorporated with the empire of Austria; and his majesty the emperor of Germany and Austria shall possess them in full property and sovereignty, but by the title of Duchy only.

XI. His majesty the emperor of the French, king of Italy, engages himself to obtain, in favour of the archduke Ferdinand, elector of Salzburg, the cession by his majesty the king of Bavaria, of the principality of Wurtzburg, such as it has been given to his said majesty by the recess of the deputation of the Germanic empire, of the 25th. Feb. 1803.

The electoral title of his royal highness shall be transferred to this principality, which his royal highness shall possess in full property and sovereignty, in the same manner, and on the same conditions, that he possessed the electorate of Salzburg.

And with respect to debts, it is agreed that the new possessor shall stand charged only with those debts resulting from loans formerly agreed to by the states of the country, or the expences incurred for the effective administration of the said country.

XII. The dignity of Grand Master of the Teutonic Order, its rights, domains, and revenues, which before the present war were dependencies of Mergentheim, the chief place of the order; the other rights, domains, and revenues,

revenues, which shall be found to belong to the grand mastership at the time of the exchange of the ratifications of the present treaty; as well as the domains and revenues in possession of which the said order shall be, at the same epoch shall become hereditary in the person and descendants in the direct male line, according to the order of primogeniture, in whichever of the princes of the imperial house, as shall be appointed by his majesty the emperor of Germany and Austria. His majesty the emperor Napoleon promises his good offices to obtain, as soon as possible, for his royal highness the archduke Ferdinand, a full and entire indemnity in Germany.

XIII. His majesty the elector of Bavaria shall occupy the city of Augsburg and its territory, and unite them to his states, in full power and sovereignty. In the same manner the king of Wirtemberg may occupy, unite to his states, and possess in full property and sovereignty, the county of Borndorff; and his majesty the emperor of Germany and Austria engages himself to give no opposition.

XIV. Their majesties the kings of Bavaria and Wirtemberg, and his most serene highness the elector of Baden, shall enjoy over the territories ceded, as well as over their ancient estates, the plenitude of sovereignty, and all the rights resulting from it, which have been guaranteed to them by his majesty the emperor of the French, king of Italy, in the same manner as his majesty the emperor of Germany and Austria, and his majesty the king of Prussia, over their German states. His majesty the emperor of Germany and Austria, both as chief of the empire, and as co-estates, engages himself not to oppose any obstacle to the execution of the acts which they may have made, or will make, in consequence.

XV. His majesty the emperor of Germany and Austria, as well for himself, his heirs and successors, as for the princes of his house, their heirs and successors, renounces all the rights, as well of sovereignty as of paramount right to all pretensions whatsoever, actual or eventful, on all the states, without exception, of their majesties the kings of Bavaria and Wirtemberg, and of his most serene highness the elector of Baden, and generally on all the states, domains, and territories, comprised in the circles of Bavaria, Franconia, and Suabia, as well as to every title taken from the said domains and territories; and reciprocally, all pretensions, actual or eventual, of the said states, to the charge of the house of Austria, or its princes are, and shall be for ever extinguished; nevertheless, the renunciations contained in the present article do not concern the properties, which are by the 11th article, or which shall be, by virtue of the 12th article above, conceded to their royal highnesses the archdukes named in the said articles.

XVI. The titles of the domains and archives, the plans and maps of the different countries, towns and fortresses, ceded by the present treaty, shall be given up in the space of three months from the date of the exchange of the ratifications, to the persons that shall have acquired the property of them.

XVII. His majesty the emperor Napoleon guarantees the integrity of the empire of Austria, in the state in which it shall be in consequence of the present treaty of peace; as well as the integrity of the possessions of the princes of the house of Austria, pointed out in the 11th and 12th articles.

XVIII. The high contracting parties acknowledge the independence of the Helvetic republic, as established by the Act of Mediation, as well as the independence of the Batavian republic.

XIX. The prisoners of war made by France and her allies, from Austria, and by Austria from France and her allies, and who have not been yet restored, shall be restored within forty days from the date of the exchange of the ratifications of the present treaty.

XX. All commercial communications and relations are re-established in the two countries on the same footing as before the war.

XXI. His majesty the emperor of Germany and Austria, and his majesty the emperor of the French, king of Italy, shall maintain between them the same ceremonial as to rank and etiquette as was observed before the present war.

XXII. Within five days from the exchange of the ratifications of the present treaty, the town of Presburg, and its environs, to the extent of six leagues, shall be evacuated. Ten days after the said exchange, the French, and the troops of the allies of France, shall evacuate Moravia, Bohemia, the Viertel, Unter Vienner Wald, the Viettel Unter, Manhartsberg, Hungary, and the whole of Stiria. In the ten following days they shall evacuate the Viertel Vienner Wald and the Viertel Ober Manhartsberg; and finally, in the space of two months from the exchange of the ratifications, the French troops, and the troops of the allies of France, shall evacuate the whole of the hereditary states of his majesty the emperor of Germany and of Austria, with the exception of the place of Brannau, which shall remain for one month at the disposal of his majesty the emperor of the French, king of Italy, as a place of deport for the sick and for the artillery.

No requisition, of whatever nature, shall be made of the inhabitants during that month. But it is agreed that, at the expiration of the said month, no corps whatever of Austrian troops can be stationed or introduced within a circuit of six leagues around the said place of Brannau. It is in like manner agreed, that each of the places which are to be successively evacuated by the French troops within the times above mentioned, shall not be taken possession of by the Austrian troops till eight and forty hours after the evacuation. It is also agreed, that the magazines left by the French army in the places which they shall successively evacuate, shall remain at its disposal; and that the high contracting parties shall make an arrangement relative to all contributions of war whatsoever imposed on the different hereditary states occupied by the French army; an arrangement in virtue of which, the raising the said contributions shall entirely cease from the day of the exchange of the ratifications. The French army shall draw its provisions and

and its sustenance from its own magazines, established on the routes by which it is to proceed.

XXIII. Immediately after the exchange of the ratification of the present treaty, commissaries shall be named on both sides to give up and to receive in the names of their respective sovereigns, all parts of the Venetian territory, not occupied by the troops of his majesty the emperor of the French and king of Italy. The city of Venice, the Lagunes, and the possessions of Terra Firma, shall be given up in the space of fifteen days; Venetian Istria, and Dalmatia, the mouths of the Cattaro, the Venetian Isles in the Adriatic, and all the places and forts which they contain, in the space of six weeks from the exchange of the ratifications. The respective commissaries will take care that the separation of the artillery belonging to the republic of Venice from the Austrian artillery be exactly made, the former being to remain entire to the kingdom of Italy. They will determine by a mutual agreement the kind and nature of the objects, which being the property of the emperor of Germany and of Austria, are consequently to remain at his disposal. They will agree either on the sale to the kingdom of Italy, of the objects above mentioned, or their exchange for an equivalent quantity of artillery, or other objects of the same, or a different nature, which shall have been left by the French armies in the hereditary states.

Every facility and every assistance shall be given to the Austrian troops, and to the civil and military administrations, to return into the Austrian states by the most convenient and sure ways, as well as to the conveyance of the imperial artillery, the naval and military magazines, and other objects which are not comprehended in the stipulations of sale or exchange which may be made.

XXIV. The ratifications of the present treaty shall be exchanged within the space of eight days, or sooner if possible.

Done and signed at Presburg the 26th December, 1805.

(Signed) Ch. Maur. Talleyrand. (L. S.)
John, Prince of Lichtenstein. (L. S.)
Ignac, Count De Guylai.

We have approved, and do approve the above treaty, in all and each of its articles therein contained; we declare, that it is accepted, ratified, and confirmed; and we promise, that it shall be inviolably observed. In faith of which, we have given these presents, signed with our hand, countersigned, and sealed with our imperial seal.

At the palace of Schoenbrun, 27th Dec. 1805.

By the Emperor, Napoleon.
The Minister Secretary of State, H. B. Maret.
The Minister of Foreign Relations,
Ch. M. Talleyrand.

No. IV. *Confederation of the Rhine, July, 1806.*

THE new treaty of confederation signed at Paris, on the 12th of July, 1806, and exchanged at Munich on the 25th of the same month, consists of forty articles. The preamble states, that experience having shewn that the Germanic Constitution can give no kind of security for either internal or external peace to the south of Germany, the contracting parties to this treaty, viz. his majesty the emperor of the French on the one part, and on the other the kings of Bavaria and Wirtemberg, the elector arch chancellor,* and the elector of Baden, the duke of Berg, the landgrave of Hesse Darmstadt, the princes of Nassau, Weilberg-Usingen, of Hohenzollern, Heekingen, Siezmaringen, of Salm Salm, and Salm Kirburg, of Isenburg Brilstein, and of Lichtenstein, the duke of Ahrentberg, and the count of Leyn have agreed to the following articles:—

Art. 1. The states of the above princes are for ever separated from the German political body, and united by a particular confederation, under the name of the Confederated States of the Rhine.

Art. 2. All the laws of the empire are abrogated and null with respect to these states.

Art. 3. Each of the contracting princes renounces all such titles as have a relation to the old constitution of the empire; and on the first of August ensuing, they will formally declare their separation from the German empire.

Art. 4. The elector arch-chancellor receives the title of Prince Primate, and Most Eminent Highness; which however, confers no prerogative inconsistent with the full sovereignty enjoyed by the other contracting parties.

Art. 5. The elector of Baden, the duke of Berg, and the landgrave of Hesse Darmstadt, take the title of Grand Dukes, and Royal Highnesses, and enjoy all the rights, prerogatives, and homage due to the regal dignity. Rank and precedence among them shall be according as they are named in the first article. The head of the house of Nassau shall take the title of Duke, and the count or Leyn that of Prince.

Art. 6. The common interests of the Confederate States shall be discussed in an assembly of the league or diet, the seat of which shall be at Frankfort, and the assembly shall be divided into two colleges, that of the kings, and that of the princes.

Art. 7. The members of this confederation shall be independent of any foreign power, nor enter into any kind of service, except with the states in the confederation.

Art. 8. No member shall alienate his sovereignty, either in whole, or part, except in favour of a confederate.

2 Art.

* The Archbishop of Ratisbon.

Art. 9. All disputes which may arise between the members of the confederation shall be decided in the assembly of the league, at Frankfort.

Art. 10. The Prince Primate shall be president in the college of kings, and the duke of Nassau in that of the princes.

Art. 11. Within a month after the declaration has been made at Ratisbon, the Prince Primate of the confederation shall draw up a constitution statute, which shall determine the time when the assembly shall be convoked, and the objects and form of its deliberation.

Art. 12. The emperor Napoleon shall be declared protector of the alliance; and in quality of protector whenever the Prince Primate dies, he shall appoint his successor.

The articles 13, &c. to 23 inclusive stipulate the different cessions and acquisitions of the confederates. Thus Nassau cedes to Berg the town of Deuss and its territory. Bavaria acquires the imperial city of Nuremberg and its territory, and the Prince Primate the imperial city of Frankfort.

Art. 24 The members of the confederation reduce and include under their sovereignty all the princes, counts, and lords, within the circle of the allied territory. [Then follows a detail of the division, by which several of the more considerable principalities are divided among two, three, or more new sovereigns; as for example, the territories of Hohenlohe between Bavaria and Wurtemberg; those of Saxis among three, and those of Furstenburg among four different sovereigns.]

Art. 26. Defines the rights of sovereignty, legislation, judicial authority, the police, military conscription, and imposts.

Art. 27. The subjected princes and counts shall retain their domains, seignoral rights, &c.

The 35th article stipulates, that there shall be an alliance between the emperor of the French and the Confederated States, by virtue of which every continental war in which either of the two parties shall be engaged, shall be common to both.

Art. 36. Should a foreign or neighbouring power arm, the contracting parties shall likewise arm, to prevent surprise. The notification for such array shall be made by the emperor Napoleon. The contingent of the allies shall be divided into four parts, and the assembly of the league shall determine how many of those parts shall be put in motion.

Art. 37. Bavaria engages to fortify the cities of Augsburg and Lindau, and to make them depots of artillery, arms, ammunition and provisions.

Art. 38. The contingent of the several allied powers shall be as follows:—France, 200,000 men; Bavaria, 30,000; Wurtemberg, 12,000; Baden, 8,000; Berg, 5,000; Darmstadt, 40,000; Nassau-Hohenzollern, and others, 4000.

Art. 39 The contracting parties will admit other German princes and states into the alliance, when it shall be found suitable to the common interest.

Art. 40. The ratification of this treaty shall be exchanged at Munich on the 25th of July.

Signed by the Plenipotentiaries of the
Paris, July 12, 1806. Contracting Parties.

The instrument of the act of ratification was signed by the emperor at St. Cloud, on the 19th of July, and countersigned by the minister Talleyrand, and the secretary of state.

Hessia is said to have since joined the alliance with a contingent of more than 20,000 men.

It is said to be understood that the minor states shall abandon the rights of sovereignty such as a mint, the raising of troops, &c. It is added, that a similar confederation is formed on the north of the Meyn, by the king of Prussia, which should of course include Hessia, and the accession of this power to the southern league has not been confirmed, and may be only temporary. Thus the division will correspond with that foretold in the first edition of this work, save only with the unfortunate loss of the Austrian influence, which, to the lasting destruction of all balance of power has been transferred to France.

No. V. *Remarks on the Russian and Spanish pronunciation*, &c.*

THE confusion so frequently met with in books and maps, from the mode of expressing Russian proper names, arises principally, if not entirely, when otherwise any degree of accuracy is attended to, from this circumstance: The Germans render the third letter of the Russian alphabet, *vedi*, which is precisely the Latin or English *v*†, by their *w*, as having the same sound; pronouncing *was wollen wie*, as we should *vas vollen vie;* and accordingly, on their first coming to England, they naturally say, *vat vould ve* instead of *what would we*. Now is it well known that most of the maps and books concerning the geography or history of Russia, used in France and England, are translated from the German; in which the translators, adhering strictly to the letter of *their* original render the words, especially in our language, (for the French having no *w* may give it what sound they please,) totally different. What a different sound, for instance, in English have *Mobilew*, *Tambow*, *Tschernigow*, *Charkow*, *Okzakow*, *Saratow*, *Kiow*, *Wolga*, *Newa*, *Newski*, *Orlow*, *Daschkow*, &c. from *Mobilef*, *Tamboj*, *Chernigof*, *Kharkof*, *Otchakof*, *Saratof*, *Kief*, *Volga*, *Neva*,

* For those on the Russian the author is indebted to the Rev. Mr. Tooke

† Or *f* in the word *of*, e. g. coat of arms; man of war, &c, where the *f* is neither more nor less than a *v*.

Neva, Nefski, Orlof, Daſhkof, &c. as they are ſpelt and pronounced in Ruſſian. The Rev. Mr. Smirnove prefers rendering this termination by *ove, Tambove, Chernigove, Daſhkove, Orlove*, &c.; and his opinion ought to have great weight, as that of a gentleman, acquainted with both languages. However the difference between us is nearly if not quite none at all; and I adopted the *of*, after the Rev. Mr. Coxe, and many other reſpectable names, only for the ſake of ſimplification, and becauſe to my ear it is the better Engliſh termination of the two. At any rate the totally different German orthography ought to be for ever exploded from all Engliſh maps and writings—The Poliſh and Hungarian *c* and *z*, copied by the Germans, have likewiſe, in an inferior degree, added to the perplexities; *czar* for *tzar*, *Czernichew* for *Chernichef*, *czarowitz* for *tzarevitch*, *Petrowitz* for *Petrovitch*, &c.

The following are a few geographical terms:

Ocean—*Okeâne.*

Sea—*Morè*; *Tikoë morè*, the peaceable or Pacific ſea.
Tſchernoë morè, the black ſea.
Sredizemnie morè, the midland ſea; Mediterranean.

Lake—*Ozero*; *Bielo ozero*, the white ſea; *Ladogſkoi ozero*, the Ladoga lake.

Cape or promontory—*Noſs*, ſignifying likewiſe the noſe; as does the *Naſe* of Norway.

Strait—*Proliſe*; *Veygatſkoi proliva*, Veigat's ſtraits.

Gulf—*Zaliſe*; } *Zaliva Phinſkago*, the gulph of
Bay—*Zaliſe*; } Finland. Only one word for
Creek—*Zaliſe*; } them all.

River—*Reka.*

Mountain—*Gora.*

Hill—*Gorka*, the diminutive of *Gora.*

Valley—*Dolina.*

Foreſt—*Leſs* (pron. *Lyeſs.*)

Deſart—*Puſtyi.*

Plain—*Dolina*: alſo *Rovnina*, and *Glade.*

Peninſula—*Poluoſtrof.*

Iſland—*Oſtrof.*

Rock—*Kamen.*

City—*Gorod*; *Novgorod*, New city; *Staragorod*, or *Bohem Stargard*, Old city.

Town—*Gorodok*, the diminutive of the foregoing.

Nation or country—*Narode.*

Native country—*Rodina* or *Otéchefſvo.*

Region—*Strana.*

Kingdom—*Koroleſſvo.*

King—*Korol.*

Climate—*Klimatt* (evidently borrowed.)

Earth—*Zemla*, (pron. *Zeml ya*,) *Novazemla*, New earth; like Newfoundland.

World—*Svet*, (pron. *Sv-yet.*)

Province—*Provintzia*, or *Guberniya.*

Territory; diſtrict—*Uyeſd*; *oblaſt.*

Iſthmus—*Iſtm*, alſo *pereſcheek.*

Sound—*Sund*: *Nutka-ſund.*

Volcano—*Ogneduiſchutſchaia gora*, (burning mountain.)

Whirlpool—*Puchina.*

Haven—*Gavane.*

Port— } The ſame.
Harbour— }

From Mr. Tooke's information it likewiſe appears, that the common termination *ſkoy* is merely an adjective poſſeſſive or appellative; as *Finſkoy*, Finniſh; *Imperatorſkoy*, Imperial, &c.: So the Aluetſkoi, the Aleutian iſlands, &c.

A few remarks may alſo be offered on the Spaniſh pronunciation, from Dobrizhoffer and others.

Ch is pronounced as the German *tſch* (or *ch* in our *church*;) ſo *mucho*, *Chili*, are *mutſcho*, *Tſchili.*

X and *J* are ſounded gutturally like *h*; as *mujer*, *muher*; *jamas*, *hamas*; *Ximenez*, *Himenez.* In the ſound of *x* our author ſeems to err, for it was uniformly put by the Spaniſh in expreſſing foreign words, as *ſh*; thus *Xah* is *Shah*; *Xoa* is *Shoa*; *Xerez* is *Sherez*, &c. &c. The ſound of *x* as a mere *h* ſeems a provincialiſm, or a recent affectation. *G* before *e* or *i*, is ſounded as *j* or *h.*

ç is preciſely equal to *z.*

Ll as *li*; thus *colmilo*, *colmilio.*

n as *gn* in French; *Eſpana*; *Eſpannia.*

qu as *k.*

Link, and his ingenious tranſlator, preſent ſome remarks on the Portugueſe pronunciation. The Portugueſe do not uſe the *i* after *t*, &c. as *tierra*, *terra.* The *ch* is pronounced as in French; and both the *j* and the *x* like the French *j.* The final *ao* is ſounded *aung*; and the final *m*, which is frequent, like *ng.* The *n* between two vowels is changed to *nh*; thus *vino* becomes *vinho*, pronounced *veenyo.* The Portugueſe is averſe to the *l*; hence the articles *lo*, *la*, become ſimply *o*, *a*, this *o* being pronounced as *u.*

No. VI. *Value of Coins used in common Calculations.*

	French Money. Frs.	Cents.	*Sterling.* £.	s.	d.
A Florin of Germany, -	2	20	0	1	10
——— Austria, -	2	65	0	2	2
Rix Dollar of Prussia -	4	—	0	3	4
Dollar of N America,	5	40	0	4	6
Guinea of England,	25	—	1	1	0
Rix Dollar of Denmark,	5	70	0	4	9
Piastre of Spain, -	5	30	0	4	0
Florin of Holland, -	2	20	0	1	10
Lire of Italy - -	—	85	0	0	8½
Scudi of Rome, -	5	53	0	4	7

	French Money. Frs.	Cents.	*Sterling.* £.	s.	d.
A Ducat of Naples*, -	4	30	0	3	7
Rouble of Russia, -	4	5	0	3	4½
Rix Dollar of Sweden,	5	80	0	4	10

The common large tables of Coins are not only uselessly prolix, by including those never mentioned in books of history or travels, but present many antiquated names and values, and are in other respects often grossly erroneous.

* A German ducat is about 9s. 4*d.*; the dollar 4s. 8*d.*

ADDITIONS

ADDITIONS AND CORRECTIONS. VOL. I.

Page xxiii. *vol.* ii. *line* 21. There is an *erratum* in the text of M. Lacroix. We should read, "namely to the inferior for the development of the circumscribed cylinder, and to the superior for the development of the inscribed cylinder".

Page 25, *line* 4, *for* admitted *read* omitted.

——— 508. Among the edifices and public works of Holland, the dykes, which may be termed a kind of fortifications to protect the country from the sea, ought to have been mentioned. They are constructed of osiers and other materials, and where there are quick sands, ships laden with stones have been sunk. They require annual repairs; and occur around the Zuyder Zee, and the northern coast of the province of North Holland. They also abound in the island of Walcheren; but the western bore from the mouth of the Maas or Rhine, to near the Helder, is sufficiently defended by the dunes or hillocks of sand.

P. 551. The extent of Iceland appears to be over-rated in all the descriptions. By the Map of La Crenne, 1776, its greatest length, from the south to the most northern cape is, fifty-seven marine leagues, or one hundred and seventy-one g. miles; and the breadth, east to west, forty-six marine leagues, or one hundred and thirty-eight g. miles, being about one third less than Ireland.

P. 602. M. Walckenaer, in a note to the description of the Azores in the French translation of this work, iii. 398, mentions that the island *Corvo* seems to be clearly indicated in a Spanish map, dated 1346 in the National Library of Paris (MS. 6816, as appears from another note vi. 360): and in another map in his own possession dated 1384, formerly in the Pinelli Library, in which last *St. George* is also indicated. It would also seem that *Cape Bojador* was known in 1346, as it appears in the first map, as well as in the second. In these maps, as well as in that of Parma 1367, of which there is a copy at the *Depot de la Marine*, the Canaries, the island of Madeira, and Porto Santo, are also laid down. Apparently all these islands, and Cape Bojador, were not unknown to mariners: but the Cape of Good Hope had received a name long before it was passed; and the islands, probably at first only visited for water, escaped due notice till they began to be colonized. The jealousy of commerce has also often contributed to conceal discovery; and as the Venetians and Genoese were the chief navigators at that period, perhaps if the libraries of Italy were examined, we should find fresh proofs of these discoveries; which, as the Italians never planted colonies, were neglected and forgotten.

Hartmann, in his edition of Edrisi, 1796, p. 3, says that the Arabian geographer indicates the Canaries under the name of *Chaledat*, or the Fortunate Islands. In describing the islands in the Atlantic, according to Edrisi and the Arabian geographers, p. 310—322, Hartmann gives various opinions with regard to these islands; and the fable concerning a statue, to be found in the Parma map (which was executed at Venice in 1367 by Fr. Picigano,) may also be found in Edrisi A. D. 1153. But the Arabian names of the islands have no relation with the modern names, while, perhaps, the name of *Corvi* or the Island of Crows may be taken from the Rake, of a similar import in Edrisi. The learned editor also seems to think that the *clima* must infer the Azores. 'The story of the Almagrurin, or wanderers, who proceeded from Lisbon to a distant country in the west, may be classed among the fables concerning the early discovery of America.

Whether Madeira was first discovered by the English in 1346, as has been asserted, it seems, with the Canaries, to have been known by the Venetian navigators in the fourteenth century; and though the name of the Isle of Crows may be borrowed from Edrisi, yet the mention of St. George seems clearly to indicate that the Azores were also not unknown to the Venetians, who, in the case of Marco Polo and others, have utterly neglected their own fame; and Gibbon has justly observed that learning is less indebted to this commercial republic, than to any of the petty princes of Italy.

P. 677, *for* 'must now rather be regarded as Austrian streams.' *read*, 'scarcely present any singularity worthy of particular notice.'

END OF THE FIRST VOLUME.

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Pater-Noster, London.